



QA Batch K9805755 (Semivolatiles)

Site: Duwamish River

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| Date | Compound | % Diff | Associated Samples |
|---------|---------------------------|--------|--|
| 10/2/98 | Hexachlorocyclopentadiene | 33 1 | 98354005 98354006 98354013 98354014 98354018 98354019 |
| 10/3/98 | Hexachlorocyclopentadiene | 52 1 | 98354000 through 98354004 98354007 through 98354011 98354015 through 98354017 |
| 10/5/98 | Hexachlorocyclopentadiene | 51 6 | 98354012 |
| 10/6/98 | Hexachlorocyclopentadiene | 57 | none |

Positive results for compounds associated with the above calibrations and samples have been qualified as estimated (J)

5. Detection Limits

Instrument detection limits met project required quantitation limits.

6. Blanks

a) Laboratory Method Blanks

The following compounds were detected in laboratory method blanks:

| Blank ID | Compound (Scan No) | Concentration |
|----------------|---------------------|---------------|
| KWG9802801-4MB | Unknown (7 71 RT) | 0.1 mg/Kg |
| KWG9802801-4MB | Unknown (10 13 RT) | 0.1 mg/Kg |

As no target analytes were detected in the method blank, no qualifiers were assigned based on method blank results.

b) Field Blanks

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Site Duwamish River

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No field blanks were associated with this laboratory batch.

7. System Monitoring Compounds (Surrogates)

Surrogate compound percent recoveries met quality control criteria for all samples.

8. Laboratory Control Sample (LCS)

LCS percent recoveries met quality control criteria for all compounds

9. Matrix Spike and Matrix Spike Duplicate

Matrix spike (MS) or matrix spike duplicate (MSD) percent recovery for the following compounds were outside QC guidelines (P-project, L-laboratory).

| Sample | Fraction | Compound | Percent Recovery | QC Limits |
|-------------|--------------|--------------------|------------------|-------------------------|
| 98354013MS | Base/Neutral | 2,4-Dinitrotoluene | 94 | 28-89 (P) 40-109 (L) |
| 98354013DMS | Base/Neutral | 2,4-Dinitrotoluene | 94 | 28-89 (P) 40-109 (L) |

Relative percent differences (RPD) between the MS and MSD percent recoveries met QC guidelines for all compounds.

No action was based solely on MS/MSD data.

10. Field Duplicate Analysis

Samples 98354000 and 98354001 were field duplicates. The relative percent difference between duplicate results was within limits of 35 percent RPD for all analytes with concentrations greater than five times the reporting limit except:

| Analyte | Initial Result | Duplicate Result | % RPD |
|-----------------------|----------------|------------------|-------|
| Dibenz(a,h)anthracene | 0.68 | 0.45 | 40.7 |

Results for the analytes listed above were qualified as estimated for samples 98354000 and 98354001.

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Samples 98354007 and 98354008 were also field duplicates. The relative percent difference between duplicate results was within limits of 35 percent RPD for all analytes with concentrations greater than five times the reporting limit except

| Analyte | Initial Result | Duplicate Result | % RPD |
|----------------------|----------------|------------------|-------|
| Pyrene | 0.27 | 1.1 | 121 |
| Chrysene | 0.61 | 0.92 | 40.5 |
| Benzo(b)fluoranthene | 0.57 | 0.93 | 48 |
| Benzo(k)fluoranthene | 0.5 | 0.74 | 39 |

Results for the analytes listed above were qualified as estimated for samples 98354007 and 98354008.

11. Internal Standards Performance

Internal standard areas were within requirements of -50 percent to +100 percent of associated calibration internal standard areas for all samples except

| Internal Standard | Sample | Area | QC Limits |
|-------------------|----------|-------|-----------------|
| Perylene-d12 | 98354000 | 71875 | 108584 - 434336 |
| Perylene-d12 | 98354001 | 68379 | 108584 - 434336 |

Positive results for analytes associated with the above internal standards and samples were qualified as estimated (J). Quantitation limits for nondetected compounds associated with internal standards listed above were qualified as estimated (UJ) when internal standard areas were less than 50 percent of calibration values.

12. Sample Analysis

A cursory raw data review was performed. All laboratory deliverables were present and complete. The case narrative noted that Method Blank contained a low level TIC at a retention time of 7.7 minutes. Several samples contained TICs at the same retention time. No other unusual problems were noted.



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Site Duwamish River

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follows the format described in the *National Functional Guidelines for Organic Data Review* (EPA OSWER Directive 9240 1-05, February 1994)

1. Timeliness

All samples met holding time criteria of 14 days for sample extraction and 40 additional days for extract analysis.

2 GC/MS Instrument Performance Check

All tuning check compound mass abundances and ratios were within contract required limits

3. Initial Calibration

All target analytes and system monitoring compounds were within required limits for the initial calibration with \overline{RRF} percent relative standard deviations (percent RSD) less than 30 percent with the following exceptions

| Date | Compound | % RSD | Associated Samples |
|---------|---------------------------|-------|------------------------------|
| 10/1/98 | Hexachlorocyclopentadiene | 56.8 | 98354000 through 98354019 |

Results and quantitation limits for compounds associated with the above calibrations and samples have been qualified as estimated (J) as a high RSD is indicative of calibration nonlinearity.

For selected ion monitoring (SIM) analysis of PCP, linear regression was used for quantitation when percent RSDs exceeded 30 percent.

4 Continuing Calibrations

All target analytes were within required limits for the continuing calibration with \overline{RRF} percent differences less than 25 percent except



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13. Laboratory Contact

No laboratory contact was required.

Data Assessment

Upon consideration of the data qualifications noted above, the data are ACCEPTABLE for use except where flagged with data qualifiers that modify the usefulness of the individual values.

Data Qualifiers

- U - The compound was analyzed for, but was not detected
- UJ - The compound was analyzed for, but was not detected. The associated quantitation limit is an estimate because quality control criteria were not met.
- J - The analyte was positively identified, but the associated numerical value is an estimated quantity because quality control criteria were not met or because concentrations reported are less than CRDL or lowest calibration standard.
- R - Quality control indicates that data are unusable (compound may or may not be present). Resampling and reanalysis are necessary for verification
- N - Presumptive evidence of presence of material (tentative identification).

This document was prepared by Roy F. Weston, Inc. expressly for the EPA. It shall not be disclosed in whole or in part without the express, written permission of the EPA.

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Roy F Weston, Inc
 Project: Duwamish River/4000-027-001-2019-38
 Sample Matrix: Sediment

Service Request: K9805755
 Date Collected: 8/24/98
 Date Received: 8/25/98

Base Neutral/Acid Semivolatile Organic Compounds

| Sample Name | 98354000 | | | Units | mg/Kg (ppm) | | | |
|---------------------------------|--------------|-----------------|------|-----------------|----------------|---------------|--------|--------------|
| Lab Code | K9805755-001 | | | Basis | Dry | | | |
| Analyte | Prep Method | Analysis Method | MRL | Dilution Factor | Date Extracted | Date Analyzed | Result | Result Notes |
| Bis(2-chloroethyl) Ether | EPA 3550A | 8270C | 0 04 | 1 | 8/28/98 | 10/3/98 | ND | |
| Phenol | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 04 | |
| 2-Chlorophenol | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| 1,3-Dichlorobenzene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| 1,2-Dichlorobenzene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| 1,4-Dichlorobenzene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Benzyl Alcohol | EPA 3550A | 8270C | 0 05 | 1 | 8/28/98 | 10/3/98 | ND | |
| Bis(2-chloroisopropyl) Ether | EPA 3550A | 8270C | 0 04 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2-Methylphenol | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Hexachloroethane | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| N-Nitrosodi-n-propylamine | EPA 3550A | 8270C | 0 04 | 1 | 8/28/98 | 10/3/98 | ND | |
| 3- and 4-Methylphenol Coelution | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Nitrobenzene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Isophorone | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2-Nitrophenol | EPA 3550A | 8270C | 0 1 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2,4-Dimethylphenol | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Bis(2-chloroethoxy)methane | EPA 3550A | 8270C | 0 04 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2,4-Dichlorophenol | EPA 3550A | 8270C | 0 06 | 1 | 8/28/98 | 10/3/98 | ND | |
| Benzoic Acid | EPA 3550A | 8270C | 0 2 | 1 | 8/28/98 | 10/3/98 | ND | |
| 1,2,4-Trichlorobenzene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Naphthalene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 06 | |
| 4-Chloroaniline | EPA 3550A | 8270C | 0 06 | 1 | 8/28/98 | 10/3/98 | ND | |
| Hexachlorobutadiene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| 4-Chloro-3-methylphenol | EPA 3550A | 8270C | 0 04 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2-Methylnaphthalene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 09 | |
| Hexachlorocyclopentadiene | EPA 3550A | 8270C | 0 1 | 1 | 8/28/98 | 10/3/98 | ND | WJ |
| 2,4,6-Trichlorophenol | EPA 3550A | 8270C | 0 2 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2,4,5-Trichlorophenol | EPA 3550A | 8270C | 0 2 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2-Chloronaphthalene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2-Nitroaniline | EPA 3550A | 8270C | 0 1 | 1 | 8/28/98 | 10/3/98 | ND | |
| Acenaphthylene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Dimethyl Phthalate | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 07 | |
| 2,6-Dinitrotoluene | EPA 3550A | 8270C | 0 2 | 1 | 8/28/98 | 10/3/98 | ND | |
| Acenaphthene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 25 | |
| 3-Nitroaniline | EPA 3550A | 8270C | 0 2 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2,4-Dinitrophenol | EPA 3550A | 8270C | 0 2 | 1 | 8/28/98 | 10/3/98 | ND | |
| Dibenzofuran | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 12 | |
| 4-Nitrophenol | EPA 3550A | 8270C | 0 1 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2,4-Dinitrotoluene | EPA 3550A | 8270C | 0 2 | 1 | 8/28/98 | 10/3/98 | ND | |
| Fluorene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 18 | |
| 4-Chlorophenyl Phenyl Ether | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Diethyl Phthalate | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |

Approved By
05735SVM.AYI - 110/13/98

C. Hanes

Date 10/14/98

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Roy F Weston, Inc
Project: Duwamish River/4000-027-001-2019-38
Sample Matrix: Sediment

Service Request: K9805755
Date Collected: 8/24/98
Date Received: 8/25/98

Base Neutral/Acid Semivolatile Organic Compounds

| Sample Name | 98354000 | Units | mg/Kg (ppm) |
|-------------|--------------|-------|-------------|
| Lab Code | K9805755-001 | Basis | Dry |

| Analyte | Prep Method | Analysis Method | MRL | Dilution Factor | Date Extracted | Date Analyzed | Result | Result Notes |
|-----------------------------|-------------|-----------------|------|-----------------|----------------|---------------|--------|--------------|
| 4-Nitroaniline | EPA 3550A | 8270C | 0 1 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2-Methyl-4,6-dinitrophenol | EPA 3550A | 8270C | 0 2 | 1 | 8/28/98 | 10/3/98 | ND | |
| N-Nitrosodiphenylamine | EPA 3550A | 8270C | 0 04 | 1 | 8/28/98 | 10/3/98 | ND | |
| 4-Bromophenyl Phenyl Ether | EPA 3550A | 8270C | 0 04 | 1 | 8/28/98 | 10/3/98 | ND | |
| Hexachlorobenzene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Pentachlorophenol (PCP) | EPA 3550A | 8270C | 0 1 | 1 | 8/28/98 | 10/3/98 | ND | |
| Phenanthrene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 2 4 | |
| Anthracene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 54 | |
| Di-n-butyl Phthalate | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 09 | |
| Fluoranthene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 3 5 | |
| Pyrene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 7 4 | |
| Butyl Benzyl Phthalate | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 27 | |
| 3,3'-Dichlorobenzidine | EPA 3550A | 8270C | 0 2 | 1 | 8/28/98 | 10/3/98 | ND | |
| Benz(a)anthracene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 2 6 | |
| Chrysene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 3 5 | |
| Bis(2-ethylhexyl) Phthalate | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 5 1 | |
| Di-n-octyl Phthalate | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 57 J | |
| Benzo(b)fluoranthene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 4 7 J | |
| Benzo(k)fluoranthene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 3 3 J | |
| Benzo(a)pyrene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 3 5 J | |
| Indeno(1,2,3-cd)pyrene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 2 3 J | |
| Dibenz(a,h)anthracene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 68 J | |
| Benzo(g,h,i)perylene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 2 1 J | |
| Carbazole | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 41 | |

Approved By _____
 1S2p/002958VM.AY1 - 1 10/13/98

CCHanes

Date 10/14/98

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Roy F Weston, Inc
Project: Duwamish River/4000-027-001-2019-38
Sample Matrix: Sediment

Service Request: K9805755
Date Collected: 8/24/98
Date Received: 8/25/98
Date Extracted: 8/28/98
Date Analyzed: 10/3/98

Tentatively Identified Compounds (TIC)
Base Neutral/Acid Semivolatile Organic Compounds

Sample Name 98354000
Lab Code K9805755-001
Test Notes

Prep Method EPA 3550A
Analysis Method 8270C
Units mg/Kg (ppm)
Basis Dry

| CAS Number | TIC | Retention Time (minutes) | Estimated Concentration | Result Notes |
|------------|-------------------------------------|--------------------------|-------------------------|--------------|
| 123-42-2 | 2-Pentanone, 4-hydroxy-4-methyl- | 5.04 | 1.3 | |
| - | Unknown | 5.30 | 0.8 | |
| - | Unknown | 7.00 | 0.9 | |
| - | Unknown | 9.52 | 0.3 | |
| 1618-22-0 | Naphthalene, decahydro-2,6-dimethyl | 10.72 | 0.3 | |
| - | Unknown | 11.52 | 0.4 | |
| - | Unknown | 11.75 | 0.4 | |
| - | Unknown | 11.93 | 0.4 | |
| - | Unknown PAH | 14.20 | 0.3 | |
| - | Unknown | 14.67 | 0.4 | |
| 25154-52-3 | Phenol, nonyl- | 18.39 | 0.3 | |
| - | Unknown | 18.86 | 0.4 | |
| 203-64-5 | 4H-Cyclopenta[def]phenanthrene | 20.67 | 0.7 | |
| - | Unknown PAH | 20.72 | 0.3 | |
| 84-65-1 | 9,10-Anthracenedione | 21.14 | 0.5 | |
| - | Unknown | 22.19 | 0.9 | |
| - | Unknown PAH | 23.99 | 0.5 | |
| 192-97-2 | Benzo(e)pyrene | 28.24 | 1.2 | |
| - | Unknown | 30.03 | 0.9 | |
| - | Unknown | 30.76 | 2.0 | |
| - | Unknown | 33.29 | 1.1 | |

Approved By _____

TIC/052695SVM.AY1 - IT 10/13/98

C. Dennis

Date 10/14/98

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MGT 1/2/99

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Roy F Weston, Inc
Project: Duwamish River/4000-027-001-2019-38
Sample Matrix: Sediment

Service Request: K9805755
Date Collected: 8/24/98
Date Received: 8/25/98

Base Neutral/Acid Semivolatile Organic Compounds

| Sample Name | 98354001 | | | | | | Units | mg/Kg (ppm) |
|---------------------------------|--------------|-----------------|------|-----------------|----------------|---------------|--------|--------------|
| Lab Code | K9805755-002 | | | | | | Basis | Dry |
| Analyte | Prep Method | Analysis Method | MRL | Dilution Factor | Date Extracted | Date Analyzed | Result | Result Notes |
| Bis(2-chloroethyl) Ether | EPA 3550A | 8270C | 0 04 | 1 | 8/28/98 | 10/3/98 | ND | |
| Phenol | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 03 | |
| 2-Chlorophenol | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| 1,3-Dichlorobenzene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| 1,2-Dichlorobenzene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| 1,4-Dichlorobenzene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Benzyl Alcohol | EPA 3550A | 8270C | 0 05 | 1 | 8/28/98 | 10/3/98 | ND | |
| Bis(2-chloroisopropyl) Ether | EPA 3550A | 8270C | 0 04 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2-Methylphenol | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Hexachloroethane | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| N-Nitrosodi-n-propylamine | EPA 3550A | 8270C | 0 04 | 1 | 8/28/98 | 10/3/98 | ND | |
| 3- and 4-Methylphenol Coelution | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Nitrobenzene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Isophorone | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2-Nitrophenol | EPA 3550A | 8270C | 0 1 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2,4-Dimethylphenol | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Bis(2-chloroethoxy)methane | EPA 3550A | 8270C | 0 04 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2,4-Dichlorophenol | EPA 3550A | 8270C | 0 06 | 1 | 8/28/98 | 10/3/98 | ND | |
| Benzoic Acid | EPA 3550A | 8270C | 0 2 | 1 | 8/28/98 | 10/3/98 | ND | |
| 1,2,4-Trichlorobenzene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Naphthalene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 05 | |
| 4-Chloroaniline | EPA 3550A | 8270C | 0 06 | 1 | 8/28/98 | 10/3/98 | ND | |
| Hexachlorobutadiene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| 4-Chloro-3-methylphenol | EPA 3550A | 8270C | 0 04 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2-Methylnaphthalene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 08 | |
| Hexachlorocyclopentadiene | EPA 3550A | 8270C | 0 1 | 1 | 8/28/98 | 10/3/98 | ND | WT |
| 2,4,6-Trichlorophenol | EPA 3550A | 8270C | 0 2 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2,4,5-Trichlorophenol | EPA 3550A | 8270C | 0 2 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2-Chloronaphthalene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2-Nitroaniline | EPA 3550A | 8270C | 0 1 | 1 | 8/28/98 | 10/3/98 | ND | |
| Acenaphthylene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Dimethyl Phthalate | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 04 | |
| 2,6-Dinitrotoluene | EPA 3550A | 8270C | 0 2 | 1 | 8/28/98 | 10/3/98 | ND | |
| Acenaphthene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 22 | |
| 3-Nitroaniline | EPA 3550A | 8270C | 0 2 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2,4-Dinitrophenol | EPA 3550A | 8270C | 0 2 | 1 | 8/28/98 | 10/3/98 | ND | |
| Dibenzofuran | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 11 | |
| 4-Nitrophenol | EPA 3550A | 8270C | 0 1 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2,4-Dinitrotoluene | EPA 3550A | 8270C | 0 2 | 1 | 8/28/98 | 10/3/98 | ND | |
| Fluorene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 19 | |
| 4-Chlorophenyl Phenyl Ether | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Diethyl Phthalate | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |

NFT 1/2/99

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Roy F Weston, Inc
Project: Duwamish River/4000-027-001-2019-38
Sample Matrix: Sediment

Service Request: K9805755
Date Collected: 8/24/98
Date Received: 8/25/98

Base Neutral/Acid Semivolatile Organic Compounds

| Sample Name | 98354001 | Units | mg/Kg (ppm) |
|-------------|--------------|-------|-------------|
| Lab Code | K9805755-002 | Basis | Dry |

| Analyte | Prep Method | Analysis Method | MRL | Dilution Factor | Date Extracted | Date Analyzed | Result | Result Notes |
|-----------------------------|-------------|-----------------|------|-----------------|----------------|---------------|--------|--------------|
| 4-Nitroaniline | EPA 3550A | 8270C | 0 1 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2-Methyl-4,6-dinitrophenol | EPA 3550A | 8270C | 0 2 | 1 | 8/28/98 | 10/3/98 | ND | |
| N-Nitrosodiphenylamine | EPA 3550A | 8270C | 0 04 | 1 | 8/28/98 | 10/3/98 | ND | |
| 4-Bromophenyl Phenyl Ether | EPA 3550A | 8270C | 0 04 | 1 | 8/28/98 | 10/3/98 | ND | |
| Hexachlorobenzene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Pentachlorophenol (PCP) | EPA 3550A | 8270C | 0 1 | 1 | 8/28/98 | 10/3/98 | ND | |
| Phenanthrene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 2 3 | |
| Anthracene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 52 | |
| Di-n-butyl Phthalate | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 10 | |
| Fluoranthene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 3 6 | |
| Pyrene | EPA 3550A | 8270C | 0 2 | 10 | 8/28/98 | 10/6/98 | 7 5 | |
| Butyl Benzyl Phthalate | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 23 | |
| 3,3'-Dichlorobenzidine | EPA 3550A | 8270C | 0 2 | 1 | 8/28/98 | 10/3/98 | ND | |
| Benz(a)anthracene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 2 5 | |
| Chrysene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 3 3 | |
| Bis(2-ethylhexyl) Phthalate | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 4 7 | |
| Di-n-octyl Phthalate | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 54 | J |
| Benzo(b)fluoranthene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 4 5 | |
| Benzo(k)fluoranthene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 3 2 | |
| Benzo(a)pyrene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 3 3 | |
| Indeno(1,2,3-cd)pyrene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 2 0 | |
| Dibenz(a,h)anthracene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 45 | J |
| Benzo(g,h,i)perylene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 1 7 | J |
| Carbazole | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 39 | |

NFT 1/2/99

Approved By _____

IS2p052595

C. Heines

Date 10/14/98

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Roy F Weston, Inc
Project: Duwamish River/4000-027-001-2019-38
Sample Matrix: Sediment

Service Request: K9805755
Date Collected: 8/24/98
Date Received: 8/25/98
Date Extracted: 8/28/98
Date Analyzed: 10/3/98

Tentatively Identified Compounds (TIC)
Base Neutral/Acid Semivolatile Organic Compounds

Sample Name 98354001
Lab Code K9805755-002
Test Notes

Prep Method EPA 3550A
Analysis Method 8270C
Units mg/Kg (ppm)
Basis Dry

| CAS Number | TIC | Retention Time (minutes) | Estimated Concentration | Result Notes |
|------------|----------------------------------|--------------------------|-------------------------|--------------|
| | | | | > |
| 123-42-2 | 2-Pentanone, 4-hydroxy-4-methyl- | 5.04 | 1.4 | |
| - | Unknown | 5.31 | 0.9 | |
| - | Unknown | 7.00 | 0.8 | |
| - | Unknown | 8.80 | 0.4 | |
| - | Unknown | 9.91 | 0.3 | |
| - | Unknown | 11.74 | 0.6 | |
| - | Unknown | 11.91 | 0.6 | |
| - | Unknown alkene | 12.71 | 0.8 | |
| - | Unknown | 14.66 | 0.3 | |
| - | Unknown | 18.84 | 0.3 | |
| - | Anthracene, methyl- isomer | 20.48 | 0.3 | |
| 203-64-5 | 4H-Cyclopenta[def]phenanthrene | 20.66 | 0.6 | |
| - | Unknown PAH | 20.71 | 0.3 | |
| 84-65-1 | 9,10-Anthracenedione | 21.13 | 0.5 | |
| - | Unknown | 22.17 | 0.8 | |
| - | Unknown PAH | 23.97 | 0.6 | |
| 192-97-2 | Benzo(e)pyrene | 28.21 | 1.0 | |
| - | Unknown | 29.51 | 1.1 | |
| - | Unknown | 30.02 | 0.7 | |
| - | Unknown | 30.75 | 1.7 | |

Approved By _____

C. Deenes

Date 10/14/98

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Roy F Weston, Inc
Project: Duwamish River/4000-027-001-2019-38
Sample Matrix: Sediment

Service Request: K9805755
Date Collected: 8/24/98
Date Received: 8/25/98

Base Neutral/Acid Semivolatile Organic Compounds

| Sample Name | 98354002 | Units | mg/Kg (ppm) | | | | | |
|---------------------------------|--------------|-----------------|-------------|-----------------|----------------|---------------|--------|--------------|
| Lab Code | K9805755-003 | Basis | Dry | | | | | |
| Analyte | Prep Method | Analysis Method | MRL | Dilution Factor | Date Extracted | Date Analyzed | Result | Result Notes |
| Bis(2-chloroethyl) Ether | EPA 3550A | 8270C | 0 04 | 1 | 8/28/98 | 10/3/98 | ND | |
| Phenol | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2-Chlorophenol | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| 1,3-Dichlorobenzene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| 1,2-Dichlorobenzene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| 1,4-Dichlorobenzene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Benzyl Alcohol | EPA 3550A | 8270C | 0 05 | 1 | 8/28/98 | 10/3/98 | ND | |
| Bis(2-chloroisopropyl) Ether | EPA 3550A | 8270C | 0 04 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2-Methylphenol | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Hexachloroethane | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| N-Nitrosodi-n-propylamine | EPA 3550A | 8270C | 0 04 | 1 | 8/28/98 | 10/3/98 | ND | |
| 3- and 4-Methylphenol Coelution | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Nitrobenzene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Isophorone | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2-Nitrophenol | EPA 3550A | 8270C | 0 1 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2,4-Dimethylphenol | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Bis(2-chloroethoxy)methane | EPA 3550A | 8270C | 0 04 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2,4-Dichlorophenol | EPA 3550A | 8270C | 0 06 | 1 | 8/28/98 | 10/3/98 | ND | |
| Benzoic Acid | EPA 3550A | 8270C | 0 2 | 1 | 8/28/98 | 10/3/98 | ND | |
| 1,2,4-Trichlorobenzene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Naphthalene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 03 | |
| 4-Chloroaniline | EPA 3550A | 8270C | 0 06 | 1 | 8/28/98 | 10/3/98 | ND | |
| Hexachlorobutadiene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| 4-Chloro-3-methylphenol | EPA 3550A | 8270C | 0 04 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2-Methylnaphthalene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 03 | |
| Hexachlorocyclopentadiene | EPA 3550A | 8270C | 0 1 | 1 | 8/28/98 | 10/3/98 | ND | WT |
| 2,4,6-Trichlorophenol | EPA 3550A | 8270C | 0 2 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2,4,5-Trichlorophenol | EPA 3550A | 8270C | 0 2 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2-Chloronaphthalene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2-Nitroaniline | EPA 3550A | 8270C | 0 1 | 1 | 8/28/98 | 10/3/98 | ND | |
| Acenaphthylene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Dimethyl Phthalate | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 02 | |
| 2,6-Dinitrotoluene | EPA 3550A | 8270C | 0 2 | 1 | 8/28/98 | 10/3/98 | ND | |
| Acenaphthene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 07 | |
| 3-Nitroaniline | EPA 3550A | 8270C | 0 2 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2,4-Dinitrophenol | EPA 3550A | 8270C | 0 2 | 1 | 8/28/98 | 10/3/98 | ND | |
| Dibenzofuran | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 05 | |
| 4-Nitrophenol | EPA 3550A | 8270C | 0 1 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2,4-Dinitrotoluene | EPA 3550A | 8270C | 0 2 | 1 | 8/28/98 | 10/3/98 | ND | |
| Fluorene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 07 | |
| 4-Chlorophenyl Phenyl Ether | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Diethyl Phthalate | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |

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Approved By
0575SSVM.AYI 5-10-13-98

C. Deines

Date /0/14/98

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Roy F Weston, Inc
Project: Duwamish River/4000-027-001-2019-38
Sample Matrix: Sediment

Service Request: K9805755
Date Collected: 8/24/98
Date Received: 8/25/98

Base Neutral/Acid Semivolatile Organic Compounds

| | | | |
|--------------------|--------------|--------------|-------------|
| Sample Name | 98354002 | Units | mg/Kg (ppm) |
| Lab Code | K9805755-003 | Basis | Dry |
| Test Notes | | | |

| Analyte | Prep Method | Analysis Method | MRL | Dilution Factor | Date Extracted | Date Analyzed | Result | Result Notes |
|-----------------------------|-------------|-----------------|------|-----------------|----------------|---------------|--------|--------------|
| 4-Nitroaniline | EPA 3550A | 8270C | 0 1 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2-Methyl-4,6-dinitrophenol | EPA 3550A | 8270C | 0 2 | 1 | 8/28/98 | 10/3/98 | ND | |
| N-Nitrosodiphenylamine | EPA 3550A | 8270C | 0 04 | 1 | 8/28/98 | 10/3/98 | ND | |
| 4-Bromophenyl Phenyl Ether | EPA 3550A | 8270C | 0 04 | 1 | 8/28/98 | 10/3/98 | ND | |
| Hexachlorobenzene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Pentachlorophenol (PCP) | EPA 3550A | 8270C | 0 1 | 1 | 8/28/98 | 10/3/98 | ND | |
| Phenanthrene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 1 1 | |
| Anthracene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 21 | |
| Di-n-butyl Phthalate | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 07 | |
| Fluoranthene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 2 3 | |
| Pyrene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 3 7 | |
| Butyl Benzyl Phthalate | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 12 | |
| 3,3'-Dichlorobenzidine | EPA 3550A | 8270C | 0 2 | 1 | 8/28/98 | 10/3/98 | ND | |
| Benz(a)anthracene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 1 2 | |
| Chrysene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 1 7 | |
| Bis(2-ethylhexyl) Phthalate | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 2 8 | |
| Di-n-octyl Phthalate | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 26 | |
| Benzo(b)fluoranthene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 2 4 | |
| Benzo(k)fluoranthene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 1 7 | |
| Benzo(a)pyrene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 1 7 | |
| Indeno(1,2,3-cd)pyrene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 1 1 | |
| Dibenz(a,h)anthracene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 25 | |
| Benzo(g,h,i)perylene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 83 | |
| Carbazole | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 18 | |

WAT/12/99

Approved By

IS2p/032955 VM.AY1 3 10/13/98

C. C. Barnes

Date

10/14/98

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Roy F Weston, Inc
Project: Duwamish River/4000-027-001-2019-38
Sample Matrix: Sediment

Service Request: K9805755
Date Collected: 8/24/98
Date Received: 8/25/98
Date Extracted: 8/28/98
Date Analyzed: 10/3/98

Tentatively Identified Compounds (TIC)
Base Neutral/Acid Semivolatile Organic Compounds

Sample Name: 98354002
Lab Code: K9805755-003
Test Notes:

Prep Method: EPA 3550A
Analysis Method: 8270C
Units: mg/Kg (ppm)
Basis: Dry

| CAS Number | TIC | Retention Time | Estimated Concentration | Result Notes |
|-------------------|----------------------------|-----------------------|--------------------------------|---------------------|
| | | (minutes) | | |
| - | Unknown | 8.72 | 0.2 | |
| - | Unknown | 8.83 | 0.3 | |
| - | Unknown | 11.68 | 0.3 | |
| - | Unknown | 12.69 | 0.3 | |
| 544-63-8 | Tetradecanoic acid | 18.85 | 0.3 | |
| - | Unknown PAH | 20.63 | 0.5 | |
| - | Anthracene, methyl- isomer | 20.69 | 0.3 | |
| 84-65-1 | 9,10-Anthracenedione | 21.10 | 0.3 | |
| - | Unknown | 21.69 | 0.3 | |
| - | Unknown | 22.07 | 0.3 | |
| - | Unknown | 22.16 | 1.2 | |
| - | Pentachlorobiphenyl isomer | 22.68 | 0.3 | |
| - | Unknown PAH | 23.30 | 0.4 | |
| - | Unknown PAH | 23.95 | 0.8 | |
| - | Unknown | 27.14 | 1.7 | |
| - | Unknown | 29.50 | 3.0 | |
| - | Unknown | 30.00 | 1.6 | |
| - | Unknown | 30.74 | 3.6 | |
| - | Unknown | 31.70 | 1.5 | |
| - | Unknown | 33.26 | 2.5 | |

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CC Barnes

Date

10/14/98

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Roy F Weston, Inc
Project: Duwamish River/4000-027-001-2019-38
Sample Matrix: Sediment

Service Request: K9805755
Date Collected: 8/24/98
Date Received: 8/25/98

Base Neutral/Acid Semivolatile Organic Compounds

| Sample Name | 98354003 | | | | | | Units | mg/Kg (ppm) |
|---------------------------------|--|-----------------|------|-----------------|----------------|---------------|--------|--------------|
| Lab Code | K9805755-004 <th></th> <th></th> <th></th> <th></th> <th></th> <th>Basis</th> <th>Dry</th> | | | | | | Basis | Dry |
| Analyte | Prep Method | Analysis Method | MRL | Dilution Factor | Date Extracted | Date Analyzed | Result | Result Notes |
| Bis(2-chloroethyl) Ether | EPA 3550A | 8270C | 0 04 | 1 | 8/28/98 | 10/3/98 | ND | |
| Phenol | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2-Chlorophenol | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| 1,3-Dichlorobenzene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| 1,2-Dichlorobenzene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| 1,4-Dichlorobenzene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Benzyl Alcohol | EPA 3550A | 8270C | 0 05 | 1 | 8/28/98 | 10/3/98 | ND | |
| Bis(2-chloroisopropyl) Ether | EPA 3550A | 8270C | 0 04 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2-Methylphenol | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Hexachloroethane | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| N-Nitrosodi-n-propylamine | EPA 3550A | 8270C | 0 04 | 1 | 8/28/98 | 10/3/98 | ND | |
| 3- and 4-Methylphenol Coelution | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Nitrobenzene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Isophorone | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2-Nitrophenol | EPA 3550A | 8270C | 0 1 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2,4-Dimethylphenol | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Bis(2-chloroethoxy)methane | EPA 3550A | 8270C | 0 04 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2,4-Dichlorophenol | EPA 3550A | 8270C | 0 06 | 1 | 8/28/98 | 10/3/98 | ND | |
| Benzoic Acid | EPA 3550A | 8270C | 0 2 | 1 | 8/28/98 | 10/3/98 | ND | |
| 1,2,4-Trichlorobenzene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Naphthalene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| 4-Chloroaniline | EPA 3550A | 8270C | 0 06 | 1 | 8/28/98 | 10/3/98 | ND | |
| Hexachlorobutadiene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| 4-Chloro-3-methylphenol | EPA 3550A | 8270C | 0 04 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2-Methylnaphthalene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 02 | |
| Hexachlorocyclopentadiene | EPA 3550A | 8270C | 0 1 | 1 | 8/28/98 | 10/3/98 | ND | WT |
| 2,4,6-Trichlorophenol | EPA 3550A | 8270C | 0 2 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2,4,5-Trichlorophenol | EPA 3550A | 8270C | 0 2 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2-Chloronaphthalene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2-Nitroaniline | EPA 3550A | 8270C | 0 1 | 1 | 8/28/98 | 10/3/98 | ND | |
| Acenaphthylene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Dimethyl Phthalate | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2,6-Dinitrotoluene | EPA 3550A | 8270C | 0 2 | 1 | 8/28/98 | 10/3/98 | ND | |
| Acenaphthene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 05 | |
| 3-Nitroaniline | EPA 3550A | 8270C | 0 2 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2,4-Dinitrophenol | EPA 3550A | 8270C | 0 2 | 1 | 8/28/98 | 10/3/98 | ND | |
| Dibenzofuran | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 05 | |
| 4-Nitrophenol | EPA 3550A | 8270C | 0 1 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2,4-Dinitrotoluene | EPA 3550A | 8270C | 0 2 | 1 | 8/28/98 | 10/3/98 | ND | |
| Fluorene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 07 | |
| 4-Chlorophenyl Phenyl Ether | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Diethyl Phthalate | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |

MGT/12/99

Approved By
05755SVM.AYI 410/13/98CCl₄anes

Date

10/14/98

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Roy F Weston, Inc
Project: Duwamish River/4000-027-001-2019-38
Sample Matrix: Sediment

Service Request: K9805755
Date Collected: 8/24/98
Date Received: 8/25/98

Base Neutral/Acid Semivolatile Organic Compounds

| Sample Name | 98354003 | Units | mg/Kg (ppm) |
|-------------|--------------|-------|-------------|
| Lab Code | K9805755-004 | Basis | Dry |

| Analyte | Prep Method | Analysis Method | MRL | Dilution Factor | Date Extracted | Date Analyzed | Result | Result Notes |
|-----------------------------|-------------|-----------------|------|-----------------|----------------|---------------|--------|--------------|
| 4-Nitroaniline | EPA 3550A | 8270C | 0 1 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2-Methyl-4,6-dinitrophenol | EPA 3550A | 8270C | 0 2 | 1 | 8/28/98 | 10/3/98 | ND | |
| N-Nitrosodiphenylamine | EPA 3550A | 8270C | 0 04 | 1 | 8/28/98 | 10/3/98 | ND | |
| 4-Bromophenyl Phenyl Ether | EPA 3550A | 8270C | 0 04 | 1 | 8/28/98 | 10/3/98 | ND | |
| Hexachlorobenzene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Pentachlorophenol (PCP) | EPA 3550A | 8270C | 0 1 | 1 | 8/28/98 | 10/3/98 | ND | |
| Phenanthrene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 48 | |
| Anthracene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 13 | |
| Di-n-butyl Phthalate | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 02 | |
| Fluoranthene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 1 1 | |
| Pyrene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 1 1 | |
| Butyl Benzyl Phthalate | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 05 | |
| 3,3'-Dichlorobenzidine | EPA 3550A | 8270C | 0 2 | 1 | 8/28/98 | 10/3/98 | ND | |
| Benz(a)anthracene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 42 | |
| Chrysene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 60 | |
| Bis(2-ethylhexyl) Phthalate | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 70 | |
| Di-n-octyl Phthalate | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Benzo(b)fluoranthene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 61 | |
| Benzo(k)fluoranthene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 53 | |
| Benzo(a)pyrene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 42 | |
| Indeno(1,2,3-cd)pyrene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 22 | |
| Dibenz(a,h)anthracene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 04 | |
| Benzo(g,h,i)perylene | EPA 3550A | 8270C | 0 02 | - 1 | 8/28/98 | 10/3/98 | 0 12 | |
| Carbazole | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 05 | |

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 IS2p/BS299SVM AYI - 4 10/13/98

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Date 10/14/98

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Roy F Weston, Inc
Project: Duwamish River/4000-027-001-2019-38
Sample Matrix: Sediment

Service Request: K9805755
Date Collected: 8/24/98
Date Received: 8/25/98
Date Extracted: 8/28/98
Date Analyzed: 10/3/98

Tentatively Identified Compounds (TIC)
Base Neutral/Acid Semivolatile Organic Compounds

Sample Name 98354003
Lab Code K9805755-004
Test Notes

Prep Method EPA 3550A
Analysis Method 8270C
Units mg/Kg (ppm)
Basis Dry

| CAS Number | TIC | Retention | Estimated Concentration | Result Notes |
|-------------------|--------------------|---------------------------------|--------------------------------|---------------------|
| | | Time (minutes) | | |
| 111-87-5 | 1-Octanol | 8.96 | 0.3 | |
| 544-63-8 | Tetradecanoic acid | 18.82 | 0.2 | |
| - | Unknown | 20.60 | 0.5 | |
| 57-10-3 | Hexadecanoic acid | 20.75 | 0.5 | |
| - | Unknown | 21.87 | 0.6 | |
| - | Unknown PAH | 22.80 | 0.2 | |
| - | Unknown | 23.91 | 0.4 | |
| - | Unknown aldehyde | 25.18 | 0.2 | |
| - | Unknown | 27.04 | 0.7 | |
| - | Unknown aldehyde | 27.10 | 3.0 | |
| - | Unknown aldehyde | 29.48 | 2.2 | |
| - | Unknown | 29.98 | 1.8 | |
| - | Unknown | 30.12 | 0.6 | |
| 57-88-5 | Cholesterol | 30.46 | 1.4 | |
| - | Unknown PAH | 30.70 | 1.5 | |
| - | Unknown | 32.60 | 1.2 | |
| 471-68-1 | Olean-12-ene | 32.67 | 1.3 | |
| - | Unknown | 32.75 | 1.4 | |
| - | Unknown | 33.23 | 2.4 | |
| - | Unknown | 34.17 | 0.7 | |

Approved By _____

C. Deenes

Date

10/14/98

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Roy F Weston, Inc
Project: Duwamish River/4000-027-001-2019-38
Sample Matrix: Sediment

Service Request: K9805755
Date Collected: 8/24/98
Date Received: 8/25/98

Base Neutral/Acid Semivolatile Organic Compounds

| Sample Name | 98354004 | Units | mg/Kg (ppm) | | | | | |
|---------------------------------|--------------|-----------------|-------------|-----------------|----------------|---------------|--------|--------------|
| Lab Code | K9805755-005 | Basis | Dry | | | | | |
| Analyte | Prep Method | Analysis Method | MRL | Dilution Factor | Date Extracted | Date Analyzed | Result | Result Notes |
| Bis(2-chloroethyl) Ether | EPA 3550A | 8270C | 0 04 | 1 | 8/28/98 | 10/3/98 | ND | |
| Phenol | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 12 | |
| 2-Chlorophenol | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| 1,3-Dichlorobenzene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| 1,2-Dichlorobenzene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| 1,4-Dichlorobenzene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Benzyl Alcohol | EPA 3550A | 8270C | 0 05 | 1 | 8/28/98 | 10/3/98 | ND | |
| Bis(2-chloroisopropyl) Ether | EPA 3550A | 8270C | 0 04 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2-Methylphenol | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Hexachloroethane | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| N-Nitrosodi-n-propylamine | EPA 3550A | 8270C | 0 04 | 1 | 8/28/98 | 10/3/98 | ND | |
| 3- and 4-Methylphenol Coelution | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Nitrobenzene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Isophorone | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2-Nitrophenol | EPA 3550A | 8270C | 0 1 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2,4-Dimethylphenol | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Bis(2-chloroethoxy)methane | EPA 3550A | 8270C | 0 04 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2,4-Dichlorophenol | EPA 3550A | 8270C | 0 06 | 1 | 8/28/98 | 10/3/98 | ND | |
| Benzoic Acid | EPA 3550A | 8270C | 0 2 | 1 | 8/28/98 | 10/3/98 | ND | |
| 1,2,4-Trichlorobenzene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Naphthalene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 03 | |
| 4-Chloroaniline | EPA 3550A | 8270C | 0 06 | 1 | 8/28/98 | 10/3/98 | ND | |
| Hexachlorobutadiene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| 4-Chloro-3-methylphenol | EPA 3550A | 8270C | 0 04 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2-Methylnaphthalene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Hexachlorocyclopentadiene | EPA 3550A | 8270C | 0 1 | 1 | 8/28/98 | 10/3/98 | ND | WT |
| 2,4,6-Trichlorophenol | EPA 3550A | 8270C | 0 2 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2,4,5-Trichlorophenol | EPA 3550A | 8270C | 0 2 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2-Chloronaphthalene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2-Nitroaniline | EPA 3550A | 8270C | 0 1 | 1 | 8/28/98 | 10/3/98 | ND | |
| Acenaphthylene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Dimethyl Phthalate | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2,6-Dinitrotoluene | EPA 3550A | 8270C | 0 2 | 1 | 8/28/98 | 10/3/98 | ND | |
| Acenaphthene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 05 | |
| 3-Nitroaniline | EPA 3550A | 8270C | 0 2 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2,4-Dinitrophenol | EPA 3550A | 8270C | 0 2 | 1 | 8/28/98 | 10/3/98 | ND | |
| Dibenzofuran | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 04 | |
| 4-Nitrophenol | EPA 3550A | 8270C | 0 1 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2,4-Dinitrotoluene | EPA 3550A | 8270C | 0 2 | 1 | 8/28/98 | 10/3/98 | ND | |
| Fluorene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 05 | |
| 4-Chlorophenyl Phenyl Ether | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Diethyl Phthalate | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |

WAT 10/14/98

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Roy F Weston, Inc
Project: Duwamish River/4000-027-001-2019-38
Sample Matrix: Sediment

Service Request: K9805755
Date Collected: 8/24/98
Date Received: 8/25/98

Base Neutral/Acid Semivolatile Organic Compounds

| Sample Name | 98354004 | Units | mg/Kg (ppm) | | | | | |
|-----------------------------|--------------|-----------------|-------------|-----------------|----------------|---------------|--------|--------------|
| Lab Code | K9805755-005 | Basis | Dry | | | | | |
| Analyte | Prep Method | Analysis Method | MRL | Dilution Factor | Date Extracted | Date Analyzed | Result | Result Notes |
| 4-Nitroaniline | EPA 3550A | 8270C | 0 1 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2-Methyl-4,6-dinitrophenol | EPA 3550A | 8270C | 0 2 | 1 | 8/28/98 | 10/3/98 | ND | |
| N-Nitrosodiphenylamine | EPA 3550A | 8270C | 0.04 | 1 | 8/28/98 | 10/3/98 | ND | |
| 4-Bromophenyl Phenyl Ether | EPA 3550A | 8270C | 0 04 | 1 | 8/28/98 | 10/3/98 | ND | |
| Hexachlorobenzene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Pentachlorophenol (PCP) | EPA 3550A | 8270C | 0 1 | 1 | 8/28/98 | 10/3/98 | ND | |
| Phenanthrene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0.21 | |
| Anthracene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0.07 | |
| Di-n-butyl Phthalate | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Fluoranthene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0.62 | |
| Pyrene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0.62 | |
| Butyl Benzyl Phthalate | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0.03 | |
| 3,3'-Dichlorobenzidine | EPA 3550A | 8270C | 0 2 | 1 | 8/28/98 | 10/3/98 | ND | |
| Benz(a)anthracene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0.23 | |
| Chrysene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0.32 | |
| Bis(2-ethylhexyl) Phthalate | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0.50 | |
| Di-n-octyl Phthalate | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Benzo(b)fluoranthene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0.35 | |
| Benzo(k)fluoranthene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0.27 | |
| Benzo(a)pyrene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0.19 | |
| Indeno(1,2,3-cd)pyrene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0.12 | |
| Dibenz(a,h)anthracene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0.03 | |
| Benzo(g,h,i)perylene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0.02 | |
| Carbazole | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0.02 | |

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C. C. Barnes

Date 10/14/98

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Roy F Weston, Inc
Project: Duwamish River/4000-027-001-2019-38
Sample Matrix: Sediment

Service Request: K9805755
Date Collected: 8/24/98
Date Received: 8/25/98
Date Extracted: 8/28/98
Date Analyzed: 10/3/98

Tentatively Identified Compounds (TIC)
Base Neutral/Acid Semivolatile Organic Compounds

Sample Name 98354004
Lab Code K9805755-005
Test Notes

Prep Method EPA 3550A
Analysis Method 8270C
Units mg/Kg (ppm)
Basis Dry

| CAS Number | TIC | Retention | Estimated Concentration | Result Notes |
|-------------------|-------------------|-----------------------|--------------------------------|---------------------|
| | | Time (minutes) | | |
| - | Unknown | 20 58 | 0 3 | |
| 57-10-3 | Hexadecanoic acid | 20 74 | 0 5 | |
| - | Unknown | 21 86 | 0 6 | |
| - | Unknown | 23 91 | 0 4 | |
| - | Unknown | 27 02 | 0 4 | |
| - | Unknown aldehyde | 27 08 | 2 7 | |
| - | Unknown | 27 39 | 0 4 | |
| - | Unknown | 27 85 | 0 7 | |
| - | Unknown alkene | 29 20 | 0 4 | |
| - | Unknown aldehyde | 29 48 | 1 9 | |
| - | Unknown | 29 97 | 1 2 | |
| - | Unknown | 30 11 | 0 6 | |
| 57-88-5 | Cholesterol | 30 45 | 1 5 | |
| - | Unknown | 30 70 | 1 2 | |
| - | Unknown | 31 21 | 0 3 | |
| - | Unknown | 32 59 | 0 9 | |
| - | Unknown | 32 65 | 1 2 | |
| - | Unknown | 32 74 | 1 0 | |
| - | Unknown | 33 21 | 1 9 | |
| - | Unknown | 34 15 | 0 6 | |

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Date 10/14/98

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Roy F Weston, Inc
Project: Duwamish River/4000-027-001-2019-38
Sample Matrix: Sediment

Service Request: K9805755
Date Collected: 8/24/98
Date Received: 8/25/98

Base Neutral/Acid Semivolatile Organic Compounds

| Sample Name | 98354005 | Units | mg/Kg (ppm) | | | | | |
|---------------------------------|--------------|-----------------|-------------|-----------------|----------------|---------------|--------|--------------|
| Lab Code | K9805755-006 | Basis | Dry | | | | | |
| Test Notes | | | | | | | | |
| Analyte | Prep Method | Analysis Method | MRL | Dilution Factor | Date Extracted | Date Analyzed | Result | Result Notes |
| Bis(2-chloroethyl) Ether | EPA 3550A | 8270C | 0 04 | 1 | 8/28/98 | 10/2/98 | ND | |
| Phenol | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | ND | |
| 2-Chlorophenol | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | ND | |
| 1,3-Dichlorobenzene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | ND | |
| 1,2-Dichlorobenzene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | ND | |
| 1,4-Dichlorobenzene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | ND | |
| Benzyl Alcohol | EPA 3550A | 8270C | 0 05 | 1 | 8/28/98 | 10/2/98 | ND | |
| Bis(2-chloroisopropyl) Ether | EPA 3550A | 8270C | 0 04 | 1 | 8/28/98 | 10/2/98 | ND | |
| 2-Methylphenol | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | ND | |
| Hexachloroethane | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | ND | |
| N-Nitrosodi-n-propylamine | EPA 3550A | 8270C | 0 04 | 1 | 8/28/98 | 10/2/98 | ND | |
| 3- and 4-Methylphenol Coelution | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | ND | |
| Nitrobenzene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | ND | |
| Isophorone | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | ND | |
| 2-Nitrophenol | EPA 3550A | 8270C | 0 1 | 1 | 8/28/98 | 10/2/98 | ND | |
| 2,4-Dimethylphenol | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | ND | |
| Bis(2-chloroethoxy)methane | EPA 3550A | 8270C | 0 04 | 1 | 8/28/98 | 10/2/98 | ND | |
| 2,4-Dichlorophenol | EPA 3550A | 8270C | 0 06 | 1 | 8/28/98 | 10/2/98 | ND | |
| Benzoic Acid | EPA 3550A | 8270C | 0 2 | 1 | 8/28/98 | 10/2/98 | ND | |
| 1,2,4-Trichlorobenzene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | ND | |
| Naphthalene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | ND | |
| 4-Chloroaniline | EPA 3550A | 8270C | 0 06 | 1 | 8/28/98 | 10/2/98 | ND | |
| Hexachlorobutadiene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | ND | |
| 4-Chloro-3-methylphenol | EPA 3550A | 8270C | 0 04 | 1 | 8/28/98 | 10/2/98 | ND | |
| 2-Methylnaphthalene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | ND | |
| Hexachlorocyclopentadiene | EPA 3550A | 8270C | 0 1 | 1 | 8/28/98 | 10/2/98 | ND | WT |
| 2,4,6-Trichlorophenol | EPA 3550A | 8270C | 0 2 | 1 | 8/28/98 | 10/2/98 | ND | |
| 2,4,5-Trichlorophenol | EPA 3550A | 8270C | 0 2 | 1 | 8/28/98 | 10/2/98 | ND | |
| 2-Chloronaphthalene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | ND | |
| 2-Nitroaniline | EPA 3550A | 8270C | 0 1 | 1 | 8/28/98 | 10/2/98 | ND | |
| Acenaphthylene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | ND | |
| Dimethyl Phthalate | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | ND | |
| 2,6-Dinitrotoluene | EPA 3550A | 8270C | 0 2 | 1 | 8/28/98 | 10/2/98 | ND | |
| Acenaphthene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | ND | |
| 3-Nitroaniline | EPA 3550A | 8270C | 0 2 | 1 | 8/28/98 | 10/2/98 | ND | |
| 2,4-Dinitrophenol | EPA 3550A | 8270C | 0 2 | 1 | 8/28/98 | 10/2/98 | ND | |
| Dibenzofuran | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | ND | |
| 4-Nitrophenol | EPA 3550A | 8270C | 0 1 | 1 | 8/28/98 | 10/2/98 | ND | |
| 2,4-Dinitrotoluene | EPA 3550A | 8270C | 0 2 | 1 | 8/28/98 | 10/2/98 | ND | |
| Fluorene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | 0 02 | |
| 4-Chlorophenyl Phenyl Ether | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | ND | |
| Diethyl Phthalate | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | ND | |

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05755SVM AT2 6-10-13-98

C (Haines)

Date 10/14/98

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Roy F Weston, Inc
Project: Duwamish River/4000-027-001-2019-38
Sample Matrix: Sediment

Service Request: K9805755
Date Collected: 8/24/98
Date Received: 8/25/98

Base Neutral/Acid Semivolatile Organic Compounds

| Sample Name | 98354005 | Units | mg/Kg (ppm) |
|-------------|--------------|-------|-------------|
| Lab Code | K9805755-006 | Basis | Dry |

| Analyte | Prep Method | Analysis Method | MRL | Dilution Factor | Date Extracted | Date Analyzed | Result | Result Notes |
|-----------------------------|-------------|-----------------|------|-----------------|----------------|---------------|--------|--------------|
| 4-Nitroaniline | EPA 3550A | 8270C | 0 1 | 1 | 8/28/98 | 10/2/98 | ND | |
| 2-Methyl-4,6-dinitrophenol | EPA 3550A | 8270C | 0 2 | 1 | 8/28/98 | 10/2/98 | ND | |
| N-Nitrosodiphenylamine | EPA 3550A | 8270C | 0 04 | 1 | 8/28/98 | 10/2/98 | ND | |
| 4-Bromophenyl Phenyl Ether | EPA 3550A | 8270C | 0 04 | 1 | 8/28/98 | 10/2/98 | ND | |
| Hexachlorobenzene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | ND | |
| Pentachlorophenol (PCP) | EPA 3550A | 8270C | 0 1 | 1 | 8/28/98 | 10/2/98 | ND | |
| Phenanthrene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | 0 15 | |
| Anthracene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | 0.07 | |
| Di-n-butyl Phthalate | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | ND | |
| Fluoranthene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | 0.40 | |
| Pyrene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | 0.23 | |
| Butyl Benzyl Phthalate | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | 0.02 | |
| 3,3'-Dichlorobenzidine | EPA 3550A | 8270C | 0 2 | 1 | 8/28/98 | 10/2/98 | ND | |
| Benz(a)anthracene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | 0.18 | |
| Chrysene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | 0.23 | |
| Bis(2-ethylhexyl) Phthalate | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | 0.34 | |
| Di-n-octyl Phthalate | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | ND | |
| Benzo(b)fluoranthene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | 0.24 | |
| Benzo(k)fluoranthene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | 0.20 | |
| Benzo(a)pyrene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | 0.05 | |
| Indeno(1,2,3-cd)pyrene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | 0.05 | |
| Dibenz(a,h)anthracene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | 0.03 | |
| Benzo(g,h,i)perylene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | ND | |
| Carbazole | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | ND | |

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 1S2p/082995 SVM AY2 - 6 10/13/98

CC Deines

Date 10/14/98

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Roy F. Weston, Inc
Project: Duwamish River/4000-027-001-2019-38
Sample Matrix: Sediment

Service Request: K9805755
Date Collected: 8/24/98
Date Received: 8/25/98
Date Extracted: 8/28/98
Date Analyzed: 10/2/98

Tentatively Identified Compounds (TIC)
Base Neutral/Acid Semivolatile Organic Compounds

Sample Name 98354005
Lab Code: K9805755-006
Test Notes

Prep Method EPA 3550A
Analysis Method 8270C
Units mg/Kg (ppm)
Basis Dry

| CAS Number | TIC | Retention | Estimated Concentration | Result Notes |
|------------|------------------|----------------|-------------------------|--------------|
| | | Time (minutes) | | |
| - | Unknown | 7.73 | 0.5 | X |
| - | Unknown | 21.85 | 0.4 | |
| - | Unknown | 22.32 | 0.2 | |
| - | Unknown PAH | 22.78 | 0.4 | |
| - | Unknown | 23.90 | 0.7 | |
| - | Unknown | 24.24 | 0.7 | |
| - | Unknown aldehyde | 25.15 | 0.4 | |
| - | Unknown aldehyde | 27.06 | 1.4 | |
| - | Unknown aldehyde | 29.46 | 1.4 | |
| - | Unknown | 29.95 | 0.7 | |
| - | Unknown ketone | 30.10 | 0.3 | |
| - | Unknown | 30.68 | 0.7 | |
| - | Unknown aldehyde | 31.20 | 0.5 | |
| - | Unknown | 32.41 | 0.3 | |
| - | Unknown | 32.56 | 0.5 | |
| - | Unknown PAH | 32.63 | 0.7 | |
| - | Unknown | 32.72 | 0.7 | |
| - | Unknown | 33.19 | 1.4 | |
| - | Unknown | 33.88 | 0.3 | |
| - | Unknown | 34.13 | 0.3 | |

X

See cas narrative

WAT/bkg

Approved By

D. Wiegel

Date

10/21/98

00098



Roy F Weston, Inc.
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700 5th Avenue
Seattle, WA 98104-5057
206-521-7600 • Fax 206-521-7601
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MEMORANDUM

DATE 12 January 1999

TO: David Bennett, WAM, U.S. EPA, Region X

FROM: Michelle Turner, Chemist, WESTON, Seattle
 JKM Roger McGinnis, Senior Environmental Chemist, WESTON, Seattle

SUBJECT: Validation of Semivolatile Organics (BNA) Data .
 Laboratory Batch: K9805755
 Site: Duwamish River

WORK ASSIGNMENT NO: 46-23-0JZZ

WORK ORDER NO.: 4000-019-038-5200-00

DOC. CONTROL NO.: 4000-019-038-AAAK

cc: Bruce Woods, RAP-WAM, U.S. EPA, Region X
 Dena Hughes, Site Manager, WESTON, Seattle (memo only)
 Kevin Mundell-Jackson, Database Management, WESTON, Seattle

The quality assurance review of twenty sediment samples, laboratory batch K9805755, collected from the Duwamish River has been completed. Samples were analyzed for semivolatile organics (BNAs) by Columbia Analytical Services of Kelso, Washington using EPA Method 8270. The samples were numbered:

| | | | | |
|----------|----------|----------|----------|----------|
| 98354000 | 98354001 | 98354002 | 98354003 | 98354004 |
| 98354005 | 98354006 | 98354007 | 98354008 | 98354009 |
| 98354010 | 98354011 | 98354012 | 98354013 | 98354014 |
| 98354015 | 98354016 | 98354017 | 98354018 | 98354019 |

Data Qualifications

The following comments refer to the laboratory performance in meeting the quality control criteria described in the technical specifications of the laboratory subcontract. The review

This document was prepared by Roy F Weston, Inc expressly for the EPA. It shall not be disclosed in whole or in part without the express, written permission of the EPA.



COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Roy F Weston, Inc
Project: Duwamish River/4000-027-001-2019-38
Sample Matrix: Sediment

Service Request: K9805755
Date Collected: 8/24/98
Date Received: 8/25/98

Base Neutral/Acid Semivolatile Organic Compounds

| Sample Name | 98354006 | | | | | | Units | mg/Kg (ppm) |
|---------------------------------|--------------|-----------------|------|-----------------|----------------|---------------|--------|--------------|
| Lab Code | K9805755-007 | | | | | | Basis | Dry |
| Analyte | Prep Method | Analysis Method | MRL | Dilution Factor | Date Extracted | Date Analyzed | Result | Result Notes |
| Bis(2-chloroethyl) Ether | EPA 3550A | 8270C | 0.04 | 1 | 8/28/98 | 10/2/98 | ND | |
| Phenol | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/2/98 | ND | |
| 2-Chlorophenol | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/2/98 | ND | |
| 1,3-Dichlorobenzene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/2/98 | ND | |
| 1,2-Dichlorobenzene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/2/98 | ND | |
| 1,4-Dichlorobenzene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/2/98 | ND | |
| Benzyl Alcohol | EPA 3550A | 8270C | 0.05 | 1 | 8/28/98 | 10/2/98 | ND | |
| Bis(2-chloroisopropyl) Ether | EPA 3550A | 8270C | 0.04 | 1 | 8/28/98 | 10/2/98 | ND | |
| 2-Methylphenol | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/2/98 | ND | |
| Hexachloroethane | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/2/98 | ND | |
| N-Nitrosodi-n-propylamine | EPA 3550A | 8270C | 0.04 | 1 | 8/28/98 | 10/2/98 | ND | |
| 3- and 4-Methylphenol Coelution | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/2/98 | ND | |
| Nitrobenzene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/2/98 | ND | |
| Isophorone | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/2/98 | ND | |
| 2-Nitrophenol | EPA 3550A | 8270C | 0.1 | 1 | 8/28/98 | 10/2/98 | ND | |
| 2,4-Dimethylphenol | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/2/98 | ND | |
| Bis(2-chloroethoxy)methane | EPA 3550A | 8270C | 0.04 | 1 | 8/28/98 | 10/2/98 | ND | |
| 2,4-Dichlorophenol | EPA 3550A | 8270C | 0.06 | 1 | 8/28/98 | 10/2/98 | ND | |
| Benzoic Acid | EPA 3550A | 8270C | 0.2 | 1 | 8/28/98 | 10/2/98 | ND | |
| 1,2,4-Trichlorobenzene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/2/98 | ND | |
| Naphthalene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/2/98 | ND | |
| 4-Chloroaniline | EPA 3550A | 8270C | 0.06 | 1 | 8/28/98 | 10/2/98 | ND | |
| Hexachlorobutadiene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/2/98 | ND | |
| 4-Chloro-3-methylphenol | EPA 3550A | 8270C | 0.04 | 1 | 8/28/98 | 10/2/98 | ND | |
| 2-Methylnaphthalene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/2/98 | ND | |
| Hexachlorocyclopentadiene | EPA 3550A | 8270C | 0.1 | 1 | 8/28/98 | 10/2/98 | ND | uJ |
| 2,4,6-Trichlorophenol | EPA 3550A | 8270C | 0.2 | 1 | 8/28/98 | 10/2/98 | ND | |
| 2,4,5-Trichlorophenol | EPA 3550A | 8270C | 0.2 | 1 | 8/28/98 | 10/2/98 | ND | |
| 2-Chloronaphthalene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/2/98 | ND | |
| 2-Nitroaniline | EPA 3550A | 8270C | 0.1 | 1 | 8/28/98 | 10/2/98 | ND | |
| Acenaphthylene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/2/98 | ND | |
| Dimethyl Phthalate | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/2/98 | ND | |
| 2,6-Dinitrotoluene | EPA 3550A | 8270C | 0.2 | 1 | 8/28/98 | 10/2/98 | ND | |
| Acenaphthene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/2/98 | ND | |
| 3-Nitroaniline | EPA 3550A | 8270C | 0.2 | 1 | 8/28/98 | 10/2/98 | ND | |
| 2,4-Dinitrophenol | EPA 3550A | 8270C | 0.2 | 1 | 8/28/98 | 10/2/98 | ND | |
| Dibenzofuran | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/2/98 | ND | |
| 4-Nitrophenol | EPA 3550A | 8270C | 0.1 | 1 | 8/28/98 | 10/2/98 | ND | |
| 2,4-Dinitrotoluene | EPA 3550A | 8270C | 0.2 | 1 | 8/28/98 | 10/2/98 | ND | |
| Fluorene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/2/98 | ND | |
| 4-Chlorophenyl Phenyl Ether | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/2/98 | ND | |
| Diethyl Phthalate | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/2/98 | ND | |

MGT/12/99

Approved By
057558VMAY2-7101398

CC Kleines

Date 10/14/98

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:
Project:
Sample Matrix:

Roy F Weston, Inc
Duwamish River/4000-027-001-2019-38
Sediment

Service Request: K9805755
Date Collected: 8/24/98
Date Received: 8/25/98

Base Neutral/Acid Semivolatile Organic Compounds

| Sample Name | 98354006 | Units | mg/Kg (ppm) |
|-------------|--------------|-------|-------------|
| Lab Code | K9805755-007 | Basis | Dry |

| Analyte | Prep Method | Analysis Method | MRL | Dilution Factor | Date Extracted | Date Analyzed | Result | Result Notes |
|-----------------------------|-------------|-----------------|------|-----------------|----------------|---------------|--------|--------------|
| 4-Nitroaniline | EPA 3550A | 8270C | 0 1 | 1 | 8/28/98 | 10/2/98 | ND | |
| 2-Methyl-4,6-dinitrophenol | EPA 3550A | 8270C | 0 2 | 1 | 8/28/98 | 10/2/98 | ND | |
| N-Nitrosodiphenylamine | EPA 3550A | 8270C | 0 04 | 1 | 8/28/98 | 10/2/98 | ND | |
| 4-Bromophenyl Phenyl Ether | EPA 3550A | 8270C | 0 04 | 1 | 8/28/98 | 10/2/98 | ND | |
| Hexachlorobenzene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | ND | |
| Pentachlorophenol (PCP) | EPA 3550A | 8270C | 0 1 | 1 | 8/28/98 | 10/2/98 | ND | |
| Phenanthrene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | 0 07 | |
| Anthracene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | ND | |
| Di-n-butyl Phthalate | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | ND | |
| Fluoranthene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | 0 10 | |
| Pyrene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | 0 07 | |
| Butyl Benzyl Phthalate | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | ND | |
| 3,3'-Dichlorobenzidine | EPA 3550A | 8270C | 0 2 | 1 | 8/28/98 | 10/2/98 | ND | |
| Benz(a)anthracene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | 0 05 | |
| Chrysene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | 0 05 | |
| Bis(2-ethylhexyl) Phthalate | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | 0 05 | |
| Di-n-octyl Phthalate | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | ND | |
| Benzo(b)fluoranthene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | 0 07 | |
| Benzo(k)fluoranthene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | 0 06 | |
| Benzo(a)pyrene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | ND | |
| Indeno(1,2,3-cd)pyrene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | ND | |
| Dibenz(a,h)anthracene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | ND | |
| Benzo(g,h,i)perylene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | ND | |
| Carbazole | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | ND | |

Approved By

1S2p/032998VM.AY2 - 7 10/13/98

C. Deines

Date

10/14/98

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WGT.12/59

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Roy F Weston, Inc
Project: Duwamish River/4000-027-001-2019-38
Sample Matrix: Sediment

Service Request: K9805755
Date Collected: 8/24/98
Date Received: 8/25/98
Date Extracted: 8/28/98
Date Analyzed: 10/2/98

Tentatively Identified Compounds (TIC)
Base Neutral/Acid Semivolatile Organic Compounds

Sample Name 98354006
Lab Code. K9805755-007
Test Notes:

Prep Method: EPA 3550A
Analysis Method 8270C
Units mg/Kg (ppm)
Basis Dry

| CAS Number | TIC | Retention Time (minutes) | Estimated Concentration | Result Notes |
|-------------------|------------------|---------------------------------|--------------------------------|---------------------|
| - | Unknown | 7.73 | 0.4 | X |
| - | Unknown | 22.78 | 0.2 | |
| - | Unknown | 23.91 | 0.2 | |
| - | Unknown aldehyde | 27.07 | 1.2 | |
| - | Unknown | 27.83 | 0.4 | |
| - | Unknown | 28.34 | 0.2 | |
| - | Unknown aldehyde | 29.46 | 0.9 | |
| - | Unknown PAH | 29.59 | 0.2 | |
| - | Unknown | 29.95 | 0.4 | |
| - | Unknown | 30.10 | 0.3 | |
| - | Unknown | 30.68 | 0.8 | |
| - | Unknown | 31.19 | 0.2 | |
| - | Unknown | 32.56 | 0.2 | |
| - | Unknown | 32.62 | 0.2 | |
| - | Unknown | 33.18 | 0.7 | |
| - | Unknown | 33.59 | 0.2 | |
| - | Unknown | 33.86 | 0.2 | |
| - | Unknown | 34.11 | 0.4 | |

X

See cas narrative

WGT/12/98

Approved By E. H. Regal

Date 10/21/98

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Roy F Weston, Inc
Project: Duwamish River/4000-027-001-2019-38
Sample Matrix: Sediment

Service Request: K9805755
Date Collected: 8/24/98
Date Received: 8/25/98

Base Neutral/Acid Semivolatile Organic Compounds

| Sample Name | 98354007 | Units | mg/Kg (ppm) | | | | | |
|---------------------------------|--------------|-----------------|-------------|-----------------|----------------|---------------|--------|--------------|
| Lab Code | K9805755-008 | Basis | Dry | | | | | |
| Analyte | Prep Method | Analysis Method | MRL | Dilution Factor | Date Extracted | Date Analyzed | Result | Result Notes |
| Bis(2-chloroethyl) Ether | EPA 3550A | 8270C | 0.04 | 1 | 8/28/98 | 10/3/98 | ND | |
| Phenol | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | 0.07 | |
| 2-Chlorophenol | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| 1,3-Dichlorobenzene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| 1,2-Dichlorobenzene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| 1,4-Dichlorobenzene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Benzyl Alcohol | EPA 3550A | 8270C | 0.05 | 1 | 8/28/98 | 10/3/98 | ND | |
| Bis(2-chloroisopropyl) Ether | EPA 3550A | 8270C | 0.04 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2-Methylphenol | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Hexachloroethane | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| N-Nitrosodi-n-propylamine | EPA 3550A | 8270C | 0.04 | 1 | 8/28/98 | 10/3/98 | ND | |
| 3- and 4-Methylphenol Coelution | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Nitrobenzene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Isophorone | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2-Nitrophenol | EPA 3550A | 8270C | 0.1 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2,4-Dimethylphenol | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Bis(2-chloroethoxy)methane | EPA 3550A | 8270C | 0.04 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2,4-Dichlorophenol | EPA 3550A | 8270C | 0.06 | 1 | 8/28/98 | 10/3/98 | ND | |
| Benzoic Acid | EPA 3550A | 8270C | 0.2 | 1 | 8/28/98 | 10/3/98 | ND | |
| 1,2,4-Trichlorobenzene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Naphthalene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| 4-Chloroaniline | EPA 3550A | 8270C | 0.06 | 1 | 8/28/98 | 10/3/98 | ND | |
| Hexachlorobutadiene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| 4-Chloro-3-methylphenol | EPA 3550A | 8270C | 0.04 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2-Methylnaphthalene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Hexachlorocyclopentadiene | EPA 3550A | 8270C | 0.1 | 1 | 8/28/98 | 10/3/98 | ND | WT |
| 2,4,6-Trichlorophenol | EPA 3550A | 8270C | 0.2 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2,4,5-Trichlorophenol | EPA 3550A | 8270C | 0.2 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2-Chloronaphthalene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2-Nitroaniline | EPA 3550A | 8270C | 0.1 | 1 | 8/28/98 | 10/3/98 | ND | |
| Acenaphthylene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Dimethyl Phthalate | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | 0.03 | |
| 2,6-Dinitrotoluene | EPA 3550A | 8270C | 0.2 | 1 | 8/28/98 | 10/3/98 | ND | |
| Acenaphthene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | 0.03 | |
| 3-Nitroaniline | EPA 3550A | 8270C | 0.2 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2,4-Dinitrophenol | EPA 3550A | 8270C | 0.2 | 1 | 8/28/98 | 10/3/98 | ND | |
| Dibenzofuran | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | 0.04 | |
| 4-Nitrophenol | EPA 3550A | 8270C | 0.1 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2,4-Dinitrotoluene | EPA 3550A | 8270C | 0.2 | 1 | 8/28/98 | 10/3/98 | ND | |
| Fluorene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | 0.07 | |
| 4-Chlorophenyl Phenyl Ether | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Diethyl Phthalate | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |

Approved By
05755SVM.AY2 - 8/10/13/98

CChenes

Date 10/14/98

00102

WT, 1/2/99

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Roy F Weston, Inc
Project: Duwamish River/4000-027-001-2019-38
Sample Matrix: Sediment

Service Request: K9805755
Date Collected: 8/24/98
Date Received: 8/25/98

Base Neutral/Acid Semivolatile Organic Compounds

| | | | |
|--------------------|--------------|--------------|-------------|
| Sample Name | 98354007 | Units | mg/Kg (ppm) |
| Lab Code | K9805755-008 | Basis | Dry |
| Test Notes | | | |

| Analyte | Prep Method | Analysis Method | MRL | Dilution Factor | Date Extracted | Date Analyzed | Result | Result Notes |
|-----------------------------|-------------|-----------------|------|-----------------|----------------|---------------|--------|--------------|
| 4-Nitroaniline | EPA 3550A | 8270C | 0 1 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2-Methyl-4,6-dinitrophenol | EPA 3550A | 8270C | 0 2 | 1 | 8/28/98 | 10/3/98 | ND | |
| N-Nitrosodiphenylamine | EPA 3550A | 8270C | 0 04 | 1 | 8/28/98 | 10/3/98 | ND | |
| 4-Bromophenyl Phenyl Ether | EPA 3550A | 8270C | 0 04 | 1 | 8/28/98 | 10/3/98 | ND | |
| Hexachlorobenzene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Pentachlorophenol (PCP) | EPA 3550A | 8270C | 0 1 | 1 | 8/28/98 | 10/3/98 | ND | |
| Phenanthrene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 77 | |
| Anthracene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 09 | |
| Di-n-butyl Phthalate | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Fluoranthene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 1 5 | |
| Pyrene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 27 J | |
| Butyl Benzyl Phthalate | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 05 | |
| 3,3'-Dichlorobenzidine | EPA 3550A | 8270C | 0 2 | 1 | 8/28/98 | 10/3/98 | ND | |
| Benz(a)anthracene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 52 | |
| Chrysene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 61 J | |
| Bis(2-ethylhexyl) Phthalate | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 50 | |
| Di-n-octyl Phthalate | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Benzo(b)fluoranthene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 57 J | |
| Benzo(k)fluoranthene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 50 J | |
| Benzo(a)pyrene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 04 | |
| Indeno(1,2,3-cd)pyrene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 06 | |
| Dibenz(a,h)anthracene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 10 | |
| Benzo(g,h,i)perylene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Carbazole | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 07 | |

Approved By _____
 LSZp/BS29988VM AY2 - 8/10/13/98

C. Barnes

Date 10/14/98

00103
Page No

WGT/12/98

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Roy F Weston, Inc
Project: Duwamish River/4000-027-001-2019-38
Sample Matrix: Sediment

Service Request: K9805755
Date Collected: 8/24/98
Date Received: 8/25/98
Date Extracted: 8/28/98
Date Analyzed: 10/3/98

Tentatively Identified Compounds (TIC)
Base Neutral/Acid Semivolatile Organic Compounds

| Sample Name | 98354007 | Prep Method | EPA 3550A |
|-------------|---------------------|--------------------------|-------------------------|
| Lab Code. | K9805755-008 | Analysis Method | 8270C |
| Test Notes | | Units | mg/Kg (ppm) |
| CAS Number | TIC | Retention Time (minutes) | Estimated Concentration |
| - | Unknown PAH | 20 62 | 0 4 |
| 112-80-1 | Oleic Acid | 22 11 | 0 5 |
| - | Unknown | 27 05 | 1 2 |
| - | Unknown aldehyde | 27 12 | 4 6 |
| - | Unknown | 27 89 | 1 6 |
| - | Unknown | 29 23 | 0 6 |
| - | Unknown aldehyde | 29 51 | 2 7 |
| - | Unknown alcohol | 30 01 | 2 1 |
| - | Unknown | 30 14 | 1 0 |
| 57-88-5 | Cholesterol | 30 50 | 3 2 |
| - | Unknown | 30 88 | 2 5 |
| - | Unknown aldehyde | 31 25 | 0 7 |
| - | Unknown | 32 64 | 2 0 |
| - | Unknown | 32 71 | 2 2 |
| - | Unknown PAH | 32 80 | 2 1 |
| - | Unknown | 33 01 | 0 4 |
| - | Unknown | 33 28 | 3 9 |
| - | Unknown | 33 58 | 0 6 |
| - | Unknown | 33 95 | 0 5 |
| 1058-61-3 | Stigmast-4-en-3-one | 34 22 | 1 0 |

Approved By _____

Chabane

Date

10/14/98

TIC/052695SVM AY2 - 8T 10/13/98

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Roy F Weston, Inc
Project: Duwamish River/4000-027-001-2019-38
Sample Matrix: Sediment

Service Request: K9805755
Date Collected: 8/24/98
Date Received: 8/25/98

Base Neutral/Acid Semivolatile Organic Compounds

| Sample Name | 98354008 | Units | mg/Kg (ppm) | | | | | |
|---------------------------------|--------------|-----------------|-------------|-----------------|----------------|---------------|--------|--------------|
| Lab Code | K9805755-009 | Basis | Dry | | | | | |
| Test Notes | | | | | | | | |
| Analyte | Prep Method | Analysis Method | MRL | Dilution Factor | Date Extracted | Date Analyzed | Result | Result Notes |
| Bis(2-chloroethyl) Ether | EPA 3550A | 8270C | 0.04 | 1 | 8/28/98 | 10/3/98 | ND | |
| Phenol | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | 0.10 | |
| 2-Chlorophenol | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| 1,3-Dichlorobenzene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| 1,2-Dichlorobenzene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| 1,4-Dichlorobenzene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Benzyl Alcohol | EPA 3550A | 8270C | 0.05 | 1 | 8/28/98 | 10/3/98 | ND | |
| Bis(2-chloroisopropyl) Ether | EPA 3550A | 8270C | 0.04 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2-Methylphenol | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Hexachloroethane | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| N-Nitrosodi-n-propylamine | EPA 3550A | 8270C | 0.04 | 1 | 8/28/98 | 10/3/98 | ND | |
| 3- and 4-Methylphenol Coelution | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Nitrobenzene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Isophorone | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2-Nitrophenol | EPA 3550A | 8270C | 0.1 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2,4-Dimethylphenol | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Bis(2-chloroethoxy)methane | EPA 3550A | 8270C | 0.04 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2,4-Dichlorophenol | EPA 3550A | 8270C | 0.06 | 1 | 8/28/98 | 10/3/98 | ND | |
| Benzoic Acid | EPA 3550A | 8270C | 0.2 | 1 | 8/28/98 | 10/3/98 | ND | |
| 1,2,4-Trichlorobenzene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Naphthalene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| 4-Chloroaniline | EPA 3550A | 8270C | 0.06 | 1 | 8/28/98 | 10/3/98 | ND | |
| Hexachlorobutadiene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| 4-Chloro-3-methylphenol | EPA 3550A | 8270C | 0.04 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2-Methylnaphthalene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Hexachlorocyclopentadiene | EPA 3550A | 8270C | 0.1 | 1 | 8/28/98 | 10/3/98 | ND | WJ |
| 2,4,6-Trichlorophenol | EPA 3550A | 8270C | 0.2 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2,4,5-Trichlorophenol | EPA 3550A | 8270C | 0.2 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2-Chloronaphthalene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2-Nitroaniline | EPA 3550A | 8270C | 0.1 | 1 | 8/28/98 | 10/3/98 | ND | |
| Acenaphthylene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Dimethyl Phthalate | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | 0.02 | |
| 2,6-Dinitrotoluene | EPA 3550A | 8270C | 0.2 | 1 | 8/28/98 | 10/3/98 | ND | |
| Acenaphthene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | 0.04 | |
| 3-Nitroaniline | EPA 3550A | 8270C | 0.2 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2,4-Dinitrophenol | EPA 3550A | 8270C | 0.2 | 1 | 8/28/98 | 10/3/98 | ND | |
| Dibenzofuran | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | 0.05 | |
| 4-Nitrophenol | EPA 3550A | 8270C | 0.1 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2,4-Dinitrotoluene | EPA 3550A | 8270C | 0.2 | 1 | 8/28/98 | 10/3/98 | ND | |
| Fluorene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | 0.07 | |
| 4-Chlorophenyl Phenyl Ether | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Diethyl Phthalate | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |

Approved By
05755SVM.AY2 - 9/10/13/98

C. Barnes

Date 10/14/98

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Roy F Weston, Inc
Project: Duwamish River/4000-027-001-2019-38
Sample Matrix: Sediment

Service Request: K9805755
Date Collected: 8/24/98
Date Received: 8/25/98

Base Neutral/Acid Semivolatile Organic Compounds

| | | | |
|--------------------|--------------|--------------|-------------|
| Sample Name | 98354008 | Units | mg/Kg (ppm) |
| Lab Code | K9805755-009 | Basis | Dry |

| Analyte | Prep Method | Analysis Method | MRL | Dilution Factor | Date Extracted | Date Analyzed | Result | Result Notes |
|-----------------------------|-------------|-----------------|------|-----------------|----------------|---------------|--|--------------|
| 4-Nitroaniline | EPA 3550A | 8270C | 0 1 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2-Methyl-4,6-dinitrophenol | EPA 3550A | 8270C | 0 2 | 1 | 8/28/98 | 10/3/98 | ND | |
| N-Nitrosodiphenylamine | EPA 3550A | 8270C | 0 04 | 1 | 8/28/98 | 10/3/98 | ND | |
| 4-Bromophenyl Phenyl Ether | EPA 3550A | 8270C | 0 04 | 1 | 8/28/98 | 10/3/98 | ND | |
| Hexachlorobenzene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Pentachlorophenol (PCP) | EPA 3550A | 8270C | 0 1 | 1 | 8/28/98 | 10/3/98 | ND | |
| Phenanthrene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 98 | |
| Anthracene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 11 | |
| Di-n-butyl Phthalate | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Fluoranthene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 2 0 | |
| Pyrene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 1 1  | |
| Butyl Benzyl Phthalate | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 04 | |
| 3,3'-Dichlorobenzidine | EPA 3550A | 8270C | 0 2 | 1 | 8/28/98 | 10/3/98 | ND | |
| Benz(a)anthracene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 62 | |
| Chrysene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 92  | |
| Bis(2-ethylhexyl) Phthalate | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 62 | |
| Di-n-octyl Phthalate | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Benzo(b)fluoranthene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 93  | |
| Benzo(k)fluoranthene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 74  | |
| Benzo(a)pyrene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 17 | |
| Indeno(1,2,3-cd)pyrene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 18 | |
| Dibenz(a,h)anthracene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 09 | |
| Benzo(g,h,i)perylene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Carbazole | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 15 | |

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Approved By _____
 1S2p/62988VM.AY2 - 9 10/13/98

Cleburnes

Date 10/14/98

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Page No

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Roy F Weston, Inc
Project: Duwamish River/4000-027-001-2019-38
Sample Matrix: Sediment

Service Request: K9805755
Date Collected: 8/24/98
Date Received: 8/25/98
Date Extracted: 8/28/98
Date Analyzed: 10/3/98

Tentatively Identified Compounds (TIC)
Base Neutral/Acid Semivolatile Organic Compounds

| Sample Name | 98354008 | Prep Method | EPA 3550A |
|-------------------|----------------------|---------------------------------|--------------------------------|
| Lab Code | K9805755-009 | Analysis Method | 8270C |
| Test Notes | | Units | mg/Kg (ppm) |
| | | Basis | Dry |
| CAS Number | TIC | Retention Time (minutes) | Estimated Concentration |
| 84-65-1 | 9,10-Anthracenedione | 21 10 | 0 5 |
| - | Unknown | 21 88 | 0 4 |
| - | Unknown PAH | 23 95 | 0 6 |
| - | Unknown | 24 27 | 0 4 |
| - | Unknown aldehyde | 25 19 | 0 5 |
| - | Unknown | 26 78 | 0 7 |
| - | Unknown | 27 05 | 0 9 |
| - | Unknown aldehyde | 27 12 | 5 0 |
| - | Unknown alcohol | 27 89 | 1 7 |
| - | Unknown aldehyde | 29 50 | 3 1 |
| - | Unknown | 30 01 | 1 6 |
| - | Unknown ketone | 30 15 | 0 9 |
| 57-88-5 | Cholesterol | 30 49 | 2 0 |
| - | Unknown | 30 87 | 1 6 |
| - | Unknown aldehyde | 31 24 | 0 7 |
| - | Unknown | 32 64 | 1 9 |
| - | Unknown | 32 70 | 2 4 |
| - | Unknown | 32 79 | 2 0 |
| - | Unknown | 33 27 | 3 7 |
| 1058-61-3 | Stigmast-4-en-3-one | 34 22 | 1 0 |

WGT 10/2/98

Approved By _____

C. Deines

Date

10/14/98

TIC/054005SSVM AY2 - 9T 10/13/98

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Roy F Weston, Inc
Project: Duwamish River/4000-027-001-2019-38
Sample Matrix: Sediment

Service Request: K9805755
Date Collected: 8/24/98
Date Received: 8/25/98

Base Neutral/Acid Semivolatile Organic Compounds

| Sample Name | 98354009 | Units | mg/Kg (ppm) | | | | | |
|---------------------------------|--------------|-----------------|-------------|-----------------|----------------|---------------|--------|--------------|
| Lab Code | K9805755-010 | Basis | Dry | | | | | |
| Test Notes | | | | | | | | |
| Analyte | Prep Method | Analysis Method | MRL | Dilution Factor | Date Extracted | Date Analyzed | Result | Result Notes |
| Bis(2-chloroethyl) Ether | EPA 3550A | 8270C | 0 04 | 1 | 8/28/98 | 10/3/98 | ND | |
| Phenol | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2-Chlorophenol | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| 1,3-Dichlorobenzene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| 1,2-Dichlorobenzene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| 1,4-Dichlorobenzene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Benzyl Alcohol | EPA 3550A | 8270C | 0 05 | 1 | 8/28/98 | 10/3/98 | ND | |
| Bis(2-chloroisopropyl) Ether | EPA 3550A | 8270C | 0 04 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2-Methylphenol | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Hexachloroethane | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| N-Nitrosodi-n-propylamine | EPA 3550A | 8270C | 0 04 | 1 | 8/28/98 | 10/3/98 | ND | |
| 3- and 4-Methylphenol Coelution | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Nitrobenzene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Isophorone | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2-Nitrophenol | EPA 3550A | 8270C | 0 1 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2,4-Dimethylphenol | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Bis(2-chloroethoxy)methane | EPA 3550A | 8270C | 0 04 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2,4-Dichlorophenol | EPA 3550A | 8270C | 0 06 | 1 | 8/28/98 | 10/3/98 | ND | |
| Benzoic Acid | EPA 3550A | 8270C | 0 2 | 1 | 8/28/98 | 10/3/98 | ND | |
| 1,2,4-Trichlorobenzene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Naphthalene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| 4-Chloroaniline | EPA 3550A | 8270C | 0 06 | 1 | 8/28/98 | 10/3/98 | ND | |
| Hexachlorobutadiene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| 4-Chloro-3-methylphenol | EPA 3550A | 8270C | 0 04 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2-Methylnaphthalene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Hexachlorocyclopentadiene | EPA 3550A | 8270C | 0 1 | 1 | 8/28/98 | 10/3/98 | ND | WT |
| 2,4,6-Trichlorophenol | EPA 3550A | 8270C | 0 2 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2,4,5-Trichlorophenol | EPA 3550A | 8270C | 0 2 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2-Chloronaphthalene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2-Nitroaniline | EPA 3550A | 8270C | 0 1 | 1 | 8/28/98 | 10/3/98 | ND | |
| Acenaphthylene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Dimethyl Phthalate | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2,6-Dinitrotoluene | EPA 3550A | 8270C | 0 2 | 1 | 8/28/98 | 10/3/98 | ND | |
| Acenaphthene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| 3-Nitroaniline | EPA 3550A | 8270C | 0 2 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2,4-Dinitrophenol | EPA 3550A | 8270C | 0 2 | 1 | 8/28/98 | 10/3/98 | ND | |
| Dibenzofuran | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| 4-Nitrophenol | EPA 3550A | 8270C | 0 1 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2,4-Dinitrotoluene | EPA 3550A | 8270C | 0 2 | 1 | 8/28/98 | 10/3/98 | ND | |
| Fluorene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 02 | |
| 4-Chlorophenyl Phenyl Ether | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Diethyl Phthalate | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |

WFT 12/19

Approved By
05755SVMAY2 - 10/10/13/98

CC Hanes

Date 10/14/98

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:
Project:
Sample Matrix:

Roy F Weston, Inc
Duwamish River/4000-027-001-2019-38
Sediment

Service Request: K9805755
Date Collected: 8/24/98
Date Received: 8/25/98

Base Neutral/Acid Semivolatile Organic Compounds

| Sample Name | 98354009 | Units | mg/Kg (ppm) |
|-------------|--------------|-------|-------------|
| Lab Code | K9805755-010 | Basis | Dry |

| Analyte | Prep Method | Analysis Method | MRL | Dilution Factor | Date Extracted | Date Analyzed | Result | Result Notes |
|-----------------------------|-------------|-----------------|------|-----------------|----------------|---------------|--------|--------------|
| 4-Nitroaniline | EPA 3550A | 8270C | 0 1 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2-Methyl-4,6-dinitrophenol | EPA 3550A | 8270C | 0 2 | 1 | 8/28/98 | 10/3/98 | ND | |
| N-Nitrosodiphenylamine | EPA 3550A | 8270C | 0 04 | 1 | 8/28/98 | 10/3/98 | ND | |
| 4-Bromophenyl Phenyl Ether | EPA 3550A | 8270C | 0 04 | 1 | 8/28/98 | 10/3/98 | ND | |
| Hexachlorobenzene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Pentachlorophenol (PCP) | EPA 3550A | 8270C | 0 1 | 1 | 8/28/98 | 10/3/98 | ND | |
| Phenanthrene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 33 | |
| Anthracene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 04 | |
| Di-n-butyl Phthalate | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Fluoranthene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 81 | |
| Pyrene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 86 | |
| Butyl Benzyl Phthalate | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 05 | |
| 3,3'-Dichlorobenzidine | EPA 3550A | 8270C | 0 2 | 1 | 8/28/98 | 10/3/98 | ND | |
| Benz(a)anthracene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 25 | |
| Chrysene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 41 | |
| Bis(2-ethylhexyl) Phthalate | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 43 | |
| Di-n-octyl Phthalate | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Benzo(b)fluoranthene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 43 | |
| Benzo(k)fluoranthene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 38 | |
| Benzo(a)pyrene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 34 | |
| Indeno(1,2,3-cd)pyrene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 22 | |
| Dibenz(a,h)anthracene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 04 | |
| Benzo(g,h,i)perylene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 05 | |
| Carbazole | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 07 | |

Approved By _____
IS2p/632988 VM.AY2 10/10/13/98

C. Davies

Date 10/14/98

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Roy F Weston, Inc
Project: Duwamish River/4000-027-001-2019-38
Sample Matrix: Sediment

Service Request: K9805755
Date Collected: 8/24/98
Date Received: 8/25/98
Date Extracted: 8/28/98
Date Analyzed: 10/3/98

Tentatively Identified Compounds (TIC)
Base Neutral/Acid Semivolatile Organic Compounds

| Sample Name | Lab Code | Test Notes | Prep Method | EPA 3550A | |
|-------------|------------------|--------------------------|-------------------------|-----------------|-------|
| | | | | Analysis Method | Units |
| CAS Number | TIC | Retention Time (minutes) | Estimated Concentration | Result Notes | |
| - | Unknown | 21 88 | 0 4 | | |
| - | Unknown aldehyde | 25 19 | 0 5 | | |
| - | Unknown | 26 78 | 0 5 | | |
| - | Unknown | 27 05 | 0 9 | | |
| - | Unknown aldehyde | 27 13 | 5 6 | | |
| - | Unknown alcohol | 27 89 | 1 6 | | |
| - | Unknown | 29 23 | 0 4 | | |
| - | Unknown aldehyde | 29 51 | 3 7 | | |
| - | Unknown ketone | 30 15 | 0 7 | | |
| 57-88-5 | Cholesterol | 30 49 | 2 8 | | |
| - | Unknown | 30 74 | 0 7 | | |
| - | Unknown | 30 88 | 1 0 | | |
| - | Unknown | 31 25 | 1 1 | | |
| - | Unknown | 32 49 | 1 6 | | |
| - | Unknown | 32 65 | 1 6 | | |
| - | Unknown | 32 71 | 1 8 | | |
| - | Unknown PAH | 32 80 | 1 6 | | |
| - | Unknown | 33 01 | 0 4 | | |
| - | Unknown | 33 27 | 3 1 | | |
| - | Unknown | 34 22 | 0 8 | | |

Approved By _____

C. Holmes

TIC/052595 SVM AY2 - 10T 10/13/98

Date 10/14/98

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Roy F Weston, Inc
Project: Duwamish River/4000-027-001-2019-38
Sample Matrix: Sediment

Service Request: K9805755
Date Collected: 8/24/98
Date Received: 8/25/98

Base Neutral/Acid Semivolatile Organic Compounds

| Sample Name | 98354010 | Units | mg/Kg (ppm) | | | | | |
|---------------------------------|--------------|-----------------|-------------|-----------------|----------------|---------------|--------|--------------|
| Lab Code | K9805755-011 | Basis | Dry | | | | | |
| Test Notes | | | | | | | | |
| Analyte | Prep Method | Analysis Method | MRL | Dilution Factor | Date Extracted | Date Analyzed | Result | Result Notes |
| Bis(2-chloroethyl) Ether | EPA 3550A | 8270C | 0 04 | 1 | 8/28/98 | 10/3/98 | ND | |
| Phenol | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 03 | |
| 2-Chlorophenol | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| 1,3-Dichlorobenzene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| 1,2-Dichlorobenzene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| 1,4-Dichlorobenzene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Benzyl Alcohol | EPA 3550A | 8270C | 0 05 | 1 | 8/28/98 | 10/3/98 | ND | |
| Bis(2-chloroisopropyl) Ether | EPA 3550A | 8270C | 0 04 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2-Methylphenol | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Hexachloroethane | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| N-Nitrosodi-n-propylamine | EPA 3550A | 8270C | 0 04 | 1 | 8/28/98 | 10/3/98 | ND | |
| 3- and 4-Methylphenol Coelution | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Nitrobenzene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Isophorone | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2-Nitrophenol | EPA 3550A | 8270C | 0 1 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2,4-Dimethylphenol | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Bis(2-chloroethoxy)methane | EPA 3550A | 8270C | 0 04 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2,4-Dichlorophenol | EPA 3550A | 8270C | 0 06 | 1 | 8/28/98 | 10/3/98 | ND | |
| Benzoic Acid | EPA 3550A | 8270C | 0 2 | 1 | 8/28/98 | 10/3/98 | ND | |
| 1,2,4-Trichlorobenzene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Naphthalene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| 4-Chloroaniline | EPA 3550A | 8270C | 0 06 | 1 | 8/28/98 | 10/3/98 | ND | |
| Hexachlorobutadiene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| 4-Chloro-3-methylphenol | EPA 3550A | 8270C | 0 04 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2-Methylnaphthalene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Hexachlorocyclopentadiene | EPA 3550A | 8270C | 0 1 | 1 | 8/28/98 | 10/3/98 | ND | WT |
| 2,4,6-Trichlorophenol | EPA 3550A | 8270C | 0 2 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2,4,5-Trichlorophenol | EPA 3550A | 8270C | 0 2 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2-Chloronaphthalene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2-Nitroaniline | EPA 3550A | 8270C | 0 1 | 1 | 8/28/98 | 10/3/98 | ND | |
| Acenaphthylene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Dimethyl Phthalate | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 02 | |
| 2,6-Dinitrotoluene | EPA 3550A | 8270C | 0 2 | 1 | 8/28/98 | 10/3/98 | ND | |
| Acenaphthene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| 3-Nitroaniline | EPA 3550A | 8270C | 0 2 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2,4-Dinitrophenol | EPA 3550A | 8270C | 0 2 | 1 | 8/28/98 | 10/3/98 | ND | |
| Dibenzofuran | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| 4-Nitrophenol | EPA 3550A | 8270C | 0 1 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2,4-Dinitrotoluene | EPA 3550A | 8270C | 0 2 | 1 | 8/28/98 | 10/3/98 | ND | |
| Fluorene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 03 | |
| 4-Chlorophenyl Phenyl Ether | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Diethyl Phthalate | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |

Approved By
05755SVM.AY3 - 11/10/13/98

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Date 10/14/98

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Roy F Weston, Inc
Project: Duwamish River/4000-027-001-2019-38
Sample Matrix: Sediment

Service Request: K9805755
Date Collected: 8/24/98
Date Received: 8/25/98

Base Neutral/Acid Semivolatile Organic Compounds

| Sample Name | 98354010 | | | Units | mg/Kg (ppm) | | | |
|-----------------------------|--------------|-----------------|------|-----------------|----------------|---------------|--------|--------------|
| Lab Code | K9805755-011 | | | Basis | Dry | | | |
| Test Notes | | | | | | | | |
| Analyte | Prep Method | Analysis Method | MRL | Dilution Factor | Date Extracted | Date Analyzed | Result | Result Notes |
| 4-Nitroaniline | EPA 3550A | 8270C | 0 1 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2-Methyl-4,6-dinitrophenol | EPA 3550A | 8270C | 0 2 | 1 | 8/28/98 | 10/3/98 | ND | |
| N-Nitrosodiphenylamine | EPA 3550A | 8270C | 0 04 | 1 | 8/28/98 | 10/3/98 | ND | |
| 4-Bromophenyl Phenyl Ether | EPA 3550A | 8270C | 0 04 | 1 | 8/28/98 | 10/3/98 | ND | |
| Hexachlorobenzene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Pentachlorophenol (PCP) | EPA 3550A | 8270C | 0 1 | 1 | 8/28/98 | 10/3/98 | ND | |
| Phenanthrene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 29 | |
| Anthracene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 06 | |
| Di-n-butyl Phthalate | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Fluoranthene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 77 | |
| Pyrene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 73 | |
| Butyl Benzyl Phthalate | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 04 | |
| 3,3'-Dichlorobenzidine | EPA 3550A | 8270C | 0 2 | 1 | 8/28/98 | 10/3/98 | ND | |
| Benz(a)anthracene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 28 | |
| Chrysene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 44 | |
| Bis(2-ethylhexyl) Phthalate | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 38 | |
| Di-n-octyl Phthalate | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Benzo(b)fluoranthene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 42 | |
| Benzo(k)fluoranthene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 36 | |
| Benzo(a)pyrene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 27 | |
| Indeno(1,2,3-cd)pyrene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 15 | |
| Dibenz(a,h)anthracene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 04 | |
| Benzo(g,h,i)perylene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 13 | |
| Carbazole | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 05 | |

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Roy F Weston, Inc
Project: Duwamish River/4000-027-001-2019-38
Sample Matrix: Sediment

Service Request: K9805755
Date Collected: 8/24/98
Date Received: 8/25/98
Date Extracted: 8/28/98
Date Analyzed: 10/3/98

Tentatively Identified Compounds (TIC)
Base Neutral/Acid Semivolatile Organic Compounds

Sample Name: 98354010
Lab Code K9805755-011
Test Notes:

Prep Method EPA 3550A
Analysis Method 8270C
Units mg/Kg (ppm)
Basis Dry

| CAS Number | TIC | Retention Time (minutes) | Estimated Concentration | Result Notes |
|-------------------|---------------------|------------------------------------|--------------------------------|---------------------|
| | | | | |
| 112-80-1 | Unknown | 20 63 | 0 9 | |
| | Unknown | 21 88 | 0 5 | |
| | Oleic acid | 22 11 | 0 5 | |
| | Unknown aldehyde | 25 19 | 0 5 | |
| | Unknown | 27 05 | 0 6 | |
| | Unknown aldehyde | 27 12 | 4 1 | |
| | Unknown | 27 88 | 1 3 | |
| | Unknown aldehyde | 29 50 | 2 7 | |
| | Unknown | 30 01 | 1 3 | |
| | Unknown ketone | 30 15 | 0 7 | |
| 57-88-5 | Cholesterol | 30 49 | 1 8 | |
| | Unknown | 30 87 | 1 4 | |
| | Unknown aldehyde | 31 24 | 0 7 | |
| | Unknown | 32 48 | 1 5 | |
| | Unknown | 32 64 | 1 5 | |
| | Unknown | 32 70 | 1 5 | |
| | Unknown | 32 80 | 1 4 | |
| | Unknown | 33 27 | 2 8 | |
| | Unknown | 33 57 | 0 5 | |
| | Stigmast-4-en-3-one | 34 21 | 0 7 | |
| 1058-61-3 | | | | |

Approved By _____

C. Heines

Date

10/14/98

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Roy F Weston, Inc
Project: Duwamish River/4000-027-001-2019-38
Sample Matrix: Sediment

Service Request: K9805755
Date Collected: 8/24/98
Date Received: 8/25/98

Base Neutral/Acid Semivolatile Organic Compounds

| Sample Name | 98354011 | Units | mg/Kg (ppm) | | | | | |
|---------------------------------|--------------|-----------------|-------------|-----------------|----------------|---------------|--------|--------------|
| Lab Code | K9805755-012 | Basis | Dry | | | | | |
| Analyte | Prep Method | Analysis Method | MRL | Dilution Factor | Date Extracted | Date Analyzed | Result | Result Notes |
| Bis(2-chloroethyl) Ether | EPA 3550A | 8270C | 0.04 | 1 | 8/28/98 | 10/3/98 | ND | |
| Phenol | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | 0.06 | |
| 2-Chlorophenol | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| 1,3-Dichlorobenzene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| 1,2-Dichlorobenzene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| 1,4-Dichlorobenzene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Benzyl Alcohol | EPA 3550A | 8270C | 0.05 | 1 | 8/28/98 | 10/3/98 | ND | |
| Bis(2-chloroisopropyl) Ether | EPA 3550A | 8270C | 0.04 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2-Methylphenol | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Hexachloroethane | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| N-Nitrosodi-n-propylamine | EPA 3550A | 8270C | 0.04 | 1 | 8/28/98 | 10/3/98 | ND | |
| 3- and 4-Methylphenol Coelution | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Nitrobenzene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Isophorone | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2-Nitrophenol | EPA 3550A | 8270C | 0.1 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2,4-Dimethylphenol | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Bis(2-chloroethoxy)methane | EPA 3550A | 8270C | 0.04 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2,4-Dichlorophenol | EPA 3550A | 8270C | 0.06 | 1 | 8/28/98 | 10/3/98 | ND | |
| Benzoic Acid | EPA 3550A | 8270C | 0.2 | 1 | 8/28/98 | 10/3/98 | ND | |
| 1,2,4-Trichlorobenzene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Naphthalene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| 4-Chloroaniline | EPA 3550A | 8270C | 0.06 | 1 | 8/28/98 | 10/3/98 | ND | |
| Hexachlorobutadiene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| 4-Chloro-3-methylphenol | EPA 3550A | 8270C | 0.04 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2-Methylnaphthalene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Hexachlorocyclopentadiene | EPA 3550A | 8270C | 0.1 | 1 | 8/28/98 | 10/3/98 | ND | WT |
| 2,4,6-Trichlorophenol | EPA 3550A | 8270C | 0.2 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2,4,5-Trichlorophenol | EPA 3550A | 8270C | 0.2 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2-Chloronaphthalene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2-Nitroaniline | EPA 3550A | 8270C | 0.1 | 1 | 8/28/98 | 10/3/98 | ND | |
| Acenaphthylene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Dimethyl Phthalate | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | 0.02 | |
| 2,6-Dinitrotoluene | EPA 3550A | 8270C | 0.2 | 1 | 8/28/98 | 10/3/98 | ND | |
| Acenaphthene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| 3-Nitroaniline | EPA 3550A | 8270C | 0.2 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2,4-Dinitrophenol | EPA 3550A | 8270C | 0.2 | 1 | 8/28/98 | 10/3/98 | ND | |
| Dibenzofuran | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| 4-Nitrophenol | EPA 3550A | 8270C | 0.1 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2,4-Dinitrotoluene | EPA 3550A | 8270C | 0.2 | 1 | 8/28/98 | 10/3/98 | ND | |
| Fluorene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| 4-Chlorophenyl Phenyl Ether | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Diethyl Phthalate | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |

Approved By
057555SV.M.AY3 12-10-13-98

C. L. Berries

Date 10/14/98

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Roy F Weston, Inc
Project: Duwamish River/4000-027-001-2019-38
Sample Matrix: Sediment

Service Request: K9805755
Date Collected: 8/24/98
Date Received: 8/25/98

Base Neutral/Acid Semivolatile Organic Compounds

| Sample Name | 98354011 | Units | mg/Kg (ppm) | | | | | |
|-----------------------------|--------------|-----------------|-------------|-----------------|----------------|---------------|--------|--------------|
| Lab Code | K9805755-012 | Basis | Dry | | | | | |
| Analyte | Prep Method | Analysis Method | MRL | Dilution Factor | Date Extracted | Date Analyzed | Result | Result Notes |
| 4-Nitroaniline | EPA 3550A | 8270C | 0 1 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2-Methyl-4,6-dinitrophenol | EPA 3550A | 8270C | 0 2 | 1 | 8/28/98 | 10/3/98 | ND | |
| N-Nitrosodiphenylamine | EPA 3550A | 8270C | 0 04 | 1 | 8/28/98 | 10/3/98 | ND | |
| 4-Bromophenyl Phenyl Ether | EPA 3550A | 8270C | 0 04 | 1 | 8/28/98 | 10/3/98 | ND | |
| Hexachlorobenzene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Pentachlorophenol (PCP) | EPA 3550A | 8270C | 0 1 | 1 | 8/28/98 | 10/3/98 | ND | |
| Phenanthrene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 17 | |
| Anthracene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 03 | |
| Di-n-butyl Phthalate | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Fluoranthene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 44 | |
| Pyrene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 46 | |
| Butyl Benzyl Phthalate | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 04 | |
| 3,3'-Dichlorobenzidine | EPA 3550A | 8270C | 0 2 | 1 | 8/28/98 | 10/3/98 | ND | |
| Benz(a)anthracene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 14 | |
| Chrysene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 25 | |
| Bis(2-ethylhexyl) Phthalate | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 47 | |
| Di-n-octyl Phthalate | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Benzo(b)fluoranthene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 27 | |
| Benzo(k)fluoranthene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 26 | |
| Benzo(a)pyrene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 19 | |
| Indeno(1,2,3-cd)pyrene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 11 | |
| Dibenz(a,h)anthracene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 03 | |
| Benzo(g,h,i)perylene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 11 | |
| Carbazole | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 03 | |

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C. Heines Date 10/14/98

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Roy F Weston, Inc
Project: Duwamish River/4000-027-001-2019-38
Sample Matrix: Sediment

Service Request: K9805755
Date Collected: 8/24/98
Date Received: 8/25/98
Date Extracted: 8/28/98
Date Analyzed: 10/3/98

Tentatively Identified Compounds (TIC)
Base Neutral/Acid Semivolatile Organic Compounds

Sample Name 98354011
Lab Code K9805755-012
Test Notes

Prep Method EPA 3550A
Analysis Method 8270C
Units mg/Kg (ppm)
Basis Dry

| CAS Number | TIC | Retention | Estimated Concentration | Result Notes |
|------------|----------------------|----------------|-------------------------|--------------|
| | | Time (minutes) | | |
| - | Unknown organic acid | 20 64 | 0 9 | |
| 112-80-1 | Oleic acid | 22 12 | 0 5 | |
| - | Unknown | 24 27 | 0 6 | |
| - | Unknown | 26 78 | 0 7 | |
| - | Unknown | 27 05 | 0 8 | |
| - | Unknown aldehyde | 27 12 | 4 6 | |
| - | Unknown | 27 89 | 1 1 | |
| - | Unknown aldehyde | 29 50 | 2 6 | |
| - | Unknown alkene | 30 01 | 1 6 | |
| - | Unknown ketone | 30 15 | 0 8 | |
| 57-88-5 | Cholesterol | 30 49 | 1 7 | |
| - | Unknown | 30 73 | 0 7 | |
| - | Unknown | 30 87 | 1 3 | |
| - | Unknown | 31 24 | 0 7 | |
| - | Unknown | 32 48 | 1 7 | |
| - | Unknown | 32 64 | 1 9 | |
| - | Unknown | 32 70 | 1 9 | |
| - | Unknown | 32 80 | 1 7 | |
| - | Unknown | 33 27 | 3 4 | |
| - | Unknown | 34 21 | 0 9 | |

Approved By _____

C. Heenes

Date 10/14/98

TIC/052695SSVM AY3 - 12T 10/13/98

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:
Project:
Sample Matrix:

Roy F Weston, Inc
Duwamish River/4000-027-001-2019-38
Sediment

Service Request: K9805755
Date Collected: 8/24/98
Date Received: 8/25/98

Base Neutral/Acid Semivolatile Organic Compounds

| Sample Name | 98354012 | | | | | | Units | mg/Kg (ppm) |
|---------------------------------|--------------|-----------------|------|-----------------|----------------|---------------|--------|--------------|
| Lab Code | K9805755-013 | | | | | | Basis | Dry |
| Analyte | Prep Method | Analysis Method | MRL | Dilution Factor | Date Extracted | Date Analyzed | Result | Result Notes |
| Bis(2-chloroethyl) Ether | EPA 3550A | 8270C | 0.04 | 1 | 8/28/98 | 10/5/98 | ND | |
| Phenol | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/5/98 | ND | |
| 2-Chlorophenol | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/5/98 | ND | |
| 1,3-Dichlorobenzene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/5/98 | ND | |
| 1,2-Dichlorobenzene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/5/98 | ND | |
| 1,4-Dichlorobenzene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/5/98 | ND | |
| Benzyl Alcohol | EPA 3550A | 8270C | 0.05 | 1 | 8/28/98 | 10/5/98 | ND | |
| Bis(2-chloroisopropyl) Ether | EPA 3550A | 8270C | 0.04 | 1 | 8/28/98 | 10/5/98 | ND | |
| 2-Methylphenol | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/5/98 | ND | |
| Hexachloroethane | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/5/98 | ND | |
| N-Nitrosodi-n-propylamine | EPA 3550A | 8270C | 0.04 | 1 | 8/28/98 | 10/5/98 | ND | |
| 3- and 4-Methylphenol Coelution | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/5/98 | ND | |
| Nitrobenzene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/5/98 | ND | |
| Isophorone | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/5/98 | ND | |
| 2-Nitrophenol | EPA 3550A | 8270C | 0.1 | 1 | 8/28/98 | 10/5/98 | ND | |
| 2,4-Dimethylphenol | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/5/98 | ND | |
| Bis(2-chloroethoxy)methane | EPA 3550A | 8270C | 0.04 | 1 | 8/28/98 | 10/5/98 | ND | |
| 2,4-Dichlorophenol | EPA 3550A | 8270C | 0.06 | 1 | 8/28/98 | 10/5/98 | ND | |
| Benzoic Acid | EPA 3550A | 8270C | 0.2 | 1 | 8/28/98 | 10/5/98 | ND | |
| 1,2,4-Trichlorobenzene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/5/98 | ND | |
| Naphthalene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/5/98 | ND | |
| 4-Chloroaniline | EPA 3550A | 8270C | 0.06 | 1 | 8/28/98 | 10/5/98 | ND | |
| Hexachlorobutadiene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/5/98 | ND | |
| 4-Chloro-3-methylphenol | EPA 3550A | 8270C | 0.04 | 1 | 8/28/98 | 10/5/98 | ND | |
| 2-Methylnaphthalene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/5/98 | ND | |
| Hexachlorocyclopentadiene | EPA 3550A | 8270C | 0.1 | 1 | 8/28/98 | 10/5/98 | ND | WT |
| 2,4,6-Trichlorophenol | EPA 3550A | 8270C | 0.2 | 1 | 8/28/98 | 10/5/98 | ND | |
| 2,4,5-Trichlorophenol | EPA 3550A | 8270C | 0.2 | 1 | 8/28/98 | 10/5/98 | ND | |
| 2-Chloronaphthalene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/5/98 | ND | |
| 2-Nitroaniline | EPA 3550A | 8270C | 0.1 | 1 | 8/28/98 | 10/5/98 | ND | |
| Acenaphthylene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/5/98 | ND | |
| Dimethyl Phthalate | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/5/98 | 0.02 | |
| 2,6-Dinitrotoluene | EPA 3550A | 8270C | 0.2 | 1 | 8/28/98 | 10/5/98 | ND | |
| Acenaphthene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/5/98 | ND | |
| 3-Nitroaniline | EPA 3550A | 8270C | 0.2 | 1 | 8/28/98 | 10/5/98 | ND | |
| 2,4-Dinitrophenol | EPA 3550A | 8270C | 0.2 | 1 | 8/28/98 | 10/5/98 | ND | |
| Dibenzofuran | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/5/98 | ND | |
| 4-Nitrophenol | EPA 3550A | 8270C | 0.1 | 1 | 8/28/98 | 10/5/98 | ND | |
| 2,4-Dinitrotoluene | EPA 3550A | 8270C | 0.2 | 1 | 8/28/98 | 10/5/98 | ND | |
| Fluorene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/5/98 | ND | |
| 4-Chlorophenyl Phenyl Ether | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/5/98 | ND | |
| Diethyl Phthalate | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/5/98 | ND | |

WGT 1/2/99

CChenes

Approved By
03755SVM.AY3 13-10-13-98

Date 10/14/98

00117

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Roy F Weston, Inc
Project: Duwamish River/4000-027-001-2019-38
Sample Matrix: Sediment

Service Request: K9805755
Date Collected: 8/24/98
Date Received: 8/25/98

Base Neutral/Acid Semivolatile Organic Compounds

| Sample Name | 98354012 | Units | mg/Kg (ppm) |
|-------------|--------------|-------|-------------|
| Lab Code | K9805755-013 | Basis | Dry |

| Analyte | Prep Method | Analysis Method | MRL | Dilution Factor | Date Extracted | Date Analyzed | Result | Result Notes |
|-----------------------------|-------------|-----------------|------|-----------------|----------------|---------------|--------|--------------|
| 4-Nitroaniline | EPA 3550A | 8270C | 0 1 | 1 | 8/28/98 | 10/5/98 | ND | |
| 2-Methyl4,6-dinitrophenol | EPA 3550A | 8270C | 0 2 | 1 | 8/28/98 | 10/5/98 | ND | |
| N-Nitrosodiphenylamine | EPA 3550A | 8270C | 0 04 | 1 | 8/28/98 | 10/5/98 | ND | |
| 4-Bromophenyl Phenyl Ether | EPA 3550A | 8270C | 0 04 | 1 | 8/28/98 | 10/5/98 | ND | |
| Hexachlorobenzene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/5/98 | ND | |
| Pentachlorophenol (PCP) | EPA 3550A | 8270C | 0 1 | 1 | 8/28/98 | 10/5/98 | ND | |
| Phenanthrene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/5/98 | 0 17 | |
| Anthracene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/5/98 | 0 03 | |
| Di-n-butyl Phthalate | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/5/98 | ND | |
| Fluoranthene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/5/98 | 0 45 | |
| Pyrene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/5/98 | 0 37 | |
| Butyl Benzyl Phthalate | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/5/98 | 0 04 | |
| 3,3'-Dichlorobenzidine | EPA 3550A | 8270C | 0 2 | 1 | 8/28/98 | 10/5/98 | ND | |
| Benz(a)anthracene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/5/98 | 0 16 | |
| Chrysene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/5/98 | 0 24 | |
| Bis(2-ethylhexyl) Phthalate | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/5/98 | 0 36 | |
| Di-n-octyl Phthalate | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/5/98 | ND | |
| Benzo(b)fluoranthene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/5/98 | 0 25 | |
| Benzo(k)fluoranthene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/5/98 | 0 20 | |
| Benzo(a)pyrene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/5/98 | 0 17 | |
| Indeno(1,2,3-cd)pyrene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/5/98 | 0.12 | |
| Dibenz(a,h)anthracene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/5/98 | 0 03 | |
| Benzo(g,h,i)perylene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/5/98 | 0 11 | |
| Carbazole | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/5/98 | 0 03 | |

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C. Haines

Date 10/14/98

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Roy F Weston, Inc
Project: Duwamish River/4000-027-001-2019-38
Sample Matrix: Sediment

Service Request: K9805755
Date Collected: 8/24/98
Date Received: 8/25/98
Date Extracted: 8/28/98
Date Analyzed: 10/5/98

Tentatively Identified Compounds (TIC)
Base Neutral/Acid Semivolatile Organic Compounds

| Sample Name | 98354012 | Prep Method | EPA 3550A |
|-------------|---------------------|--------------------------|-------------------------|
| Lab Code | K9805755-013 | Analysis Method | 8270C |
| Test Notes | | Units | mg/Kg (ppm) |
| CAS Number | TIC | Retention Time (minutes) | Estimated Concentration |
| - | Unknown | 20 56 | 0 3 |
| - | Unknown aldehyde | 25 11 | 0 4 |
| - | Unknown alcohol | 26 68 | 0 4 |
| - | Unknown aldehyde | 27 02 | 5 4 |
| 192-97-2 | Benzo(e)pyrene | 27 99 | 0 6 |
| - | Unknown | 29 14 | 0 5 |
| - | Unknown aldehyde | 29 43 | 3 5 |
| - | Unknown alkene | 29 93 | 1 6 |
| - | Unknown ketone | 30 06 | 0 6 |
| 57-88-5 | Cholesterol | 30 40 | 1 7 |
| - | Unknown | 30 78 | 1 1 |
| - | Unknown aldehyde | 31 15 | 0 8 |
| - | Unknown | 32 51 | 1 6 |
| - | Unknown | 32 58 | 1 7 |
| - | Unknown | 32 67 | 1 7 |
| 559-70-6 | beta -Amyrin | 32 87 | 0 9 |
| - | Unknown | 33 14 | 3 6 |
| - | Unknown | 33 43 | 0 8 |
| - | Unknown | 33 79 | 0 6 |
| 1058-61-3 | Stigmast-4-en-3-one | 34 05 | 0 8 |

Approved By _____

C. J. Barnes

TIC/052695 SVM.AY3 13T 10/13/98

Date 10/14/98

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WGT 12/99

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Roy F Weston, Inc
Project: Duwamish River/4000-027-001-2019-38
Sample Matrix: Sediment

Service Request: K9805755
Date Collected: 8/24/98
Date Received: 8/25/98

Base Neutral/Acid Semivolatile Organic Compounds

| Sample Name | 98354013 | | | | | | Units | mg/Kg (ppm) |
|---------------------------------|--------------|-----------------|------|-----------------|----------------|---------------|--------|--------------|
| Lab Code | K9805755-014 | | | | | | Basis | Dry |
| Analyte | Prep Method | Analysis Method | MRL | Dilution Factor | Date Extracted | Date Analyzed | Result | Result Notes |
| Bis(2-chloroethyl) Ether | EPA 3550A | 8270C | 0.04 | 1 | 8/28/98 | 10/2/98 | ND | |
| Phenol | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/2/98 | ND | |
| 2-Chlorophenol | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/2/98 | ND | |
| 1,3-Dichlorobenzene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/2/98 | ND | |
| 1,2-Dichlorobenzene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/2/98 | ND | |
| 1,4-Dichlorobenzene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/2/98 | ND | |
| Benzyl Alcohol | EPA 3550A | 8270C | 0.05 | 1 | 8/28/98 | 10/2/98 | ND | |
| Bis(2-chloroisopropyl) Ether | EPA 3550A | 8270C | 0.04 | 1 | 8/28/98 | 10/2/98 | ND | |
| 2-Methylphenol | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/2/98 | ND | |
| Hexachloroethane | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/2/98 | ND | |
| N-Nitrosodi-n-propylamine | EPA 3550A | 8270C | 0.04 | 1 | 8/28/98 | 10/2/98 | ND | |
| 3- and 4-Methylphenol Coelution | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/2/98 | ND | |
| Nitrobenzene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/2/98 | ND | |
| Isophorone | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/2/98 | ND | |
| 2-Nitrophenol | EPA 3550A | 8270C | 0.1 | 1 | 8/28/98 | 10/2/98 | ND | |
| 2,4-Dimethylphenol | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/2/98 | ND | |
| Bis(2-chloroethoxy)methane | EPA 3550A | 8270C | 0.04 | 1 | 8/28/98 | 10/2/98 | ND | |
| 2,4-Dichlorophenol | EPA 3550A | 8270C | 0.06 | 1 | 8/28/98 | 10/2/98 | ND | |
| Benzoic Acid | EPA 3550A | 8270C | 0.2 | 1 | 8/28/98 | 10/2/98 | ND | |
| 1,2,4-Trichlorobenzene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/2/98 | ND | |
| Naphthalene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/2/98 | ND | |
| 4-Chloroaniline | EPA 3550A | 8270C | 0.06 | 1 | 8/28/98 | 10/2/98 | ND | |
| Hexachlorobutadiene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/2/98 | ND | |
| 4-Chloro-3-methylphenol | EPA 3550A | 8270C | 0.04 | 1 | 8/28/98 | 10/2/98 | ND | |
| 2-Methylnaphthalene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/2/98 | ND | |
| Hexachlorocyclopentadiene | EPA 3550A | 8270C | 0.1 | 1 | 8/28/98 | 10/2/98 | ND | WT |
| 2,4,6-Trichlorophenol | EPA 3550A | 8270C | 0.2 | 1 | 8/28/98 | 10/2/98 | ND | |
| 2,4,5-Trichlorophenol | EPA 3550A | 8270C | 0.2 | 1 | 8/28/98 | 10/2/98 | ND | |
| 2-Chloronaphthalene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/2/98 | ND | |
| 2-Nitroaniline | EPA 3550A | 8270C | 0.1 | 1 | 8/28/98 | 10/2/98 | ND | |
| Acenaphthylene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/2/98 | ND | |
| Dimethyl Phthalate | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/2/98 | ND | |
| 2,6-Dinitrotoluene | EPA 3550A | 8270C | 0.2 | 1 | 8/28/98 | 10/2/98 | ND | |
| Acenaphthene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/2/98 | ND | |
| 3-Nitroaniline | EPA 3550A | 8270C | 0.2 | 1 | 8/28/98 | 10/2/98 | ND | |
| 2,4-Dinitrophenol | EPA 3550A | 8270C | 0.2 | 1 | 8/28/98 | 10/2/98 | ND | |
| Dibenzofuran | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/2/98 | ND | |
| 4-Nitrophenol | EPA 3550A | 8270C | 0.1 | 1 | 8/28/98 | 10/2/98 | ND | |
| 2,4-Dinitrotoluene | EPA 3550A | 8270C | 0.2 | 1 | 8/28/98 | 10/2/98 | ND | |
| Fluorene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/2/98 | ND | |
| 4-Chlorophenyl Phenyl Ether | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/2/98 | ND | |
| Diethyl Phthalate | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/2/98 | ND | |

WT 10/2/98

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Roy F Weston, Inc
Project: Duwamish River/4000-027-001-2019-38
Sample Matrix: Sediment

Service Request: K9805755
Date Collected: 8/24/98
Date Received: 8/25/98

Base Neutral/Acid Semivolatile Organic Compounds

| Sample Name | 98354013 | Units | mg/Kg (ppm) |
|-------------|--------------|-------|-------------|
| Lab Code | K9805755-014 | Basis | Dry |

| Analyte | Prep Method | Analysis Method | MRL | Dilution Factor | Date Extracted | Date Analyzed | Result | Result Notes |
|-----------------------------|-------------|-----------------|------|-----------------|----------------|---------------|--------|--------------|
| 4-Nitroaniline | EPA 3550A | 8270C | 0 1 | 1 | 8/28/98 | 10/2/98 | ND | |
| 2-Methyl-4,6-dinitrophenol | EPA 3550A | 8270C | 0 2 | 1 | 8/28/98 | 10/2/98 | ND | |
| N-Nitrosodiphenylamine | EPA 3550A | 8270C | 0 04 | 1 | 8/28/98 | 10/2/98 | ND | |
| 4-Bromophenyl Phenyl Ether | EPA 3550A | 8270C | 0 04 | 1 | 8/28/98 | 10/2/98 | ND | |
| Hexachlorobenzene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | ND | |
| Pentachlorophenol (PCP) | EPA 3550A | 8270C | 0 1 | 1 | 8/28/98 | 10/2/98 | ND | |
| Phenanthrene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | ND | |
| Anthracene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | ND | |
| Di-n-butyl Phthalate | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | ND | |
| Fluoranthene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | ND | |
| Pyrene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | ND | |
| Butyl Benzyl Phthalate | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | ND | |
| 3,3'-Dichlorobenzidine | EPA 3550A | 8270C | 0 2 | 1 | 8/28/98 | 10/2/98 | ND | |
| Benz(a)anthracene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | ND | |
| Chrysene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | 0 03 | |
| Bis(2-ethylhexyl) Phthalate | EPA 3550A | 8270C | 0 2 | 10 | 8/28/98 | 10/6/98 | 6 1 | |
| Di-n-octyl Phthalate | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | ND | |
| Benzo(b)fluoranthene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | ND | |
| Benzo(k)fluoranthene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | ND | |
| Benzo(a)pyrene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | ND | |
| Indeno(1,2,3-cd)pyrene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | ND | |
| Dibenz(a,h)anthracene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | ND | |
| Benzo(g,h,i)perylene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | ND | |
| Carbazole | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | ND | |

WGT 12/99

Approved By _____
IS2p052595

C. Deines

Date 10/14/98

00121

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Roy F. Weston, Inc
Project: Duwamish River/4000-027-001-2019-38
Sample Matrix: Sediment

Service Request: K9805755
Date Collected: 8/24/98
Date Received: 8/25/98
Date Extracted: 8/28/98
Date Analyzed: 10/2/98

Tentatively Identified Compounds (TIC)
Base Neutral/Acid Semivolatile Organic Compounds

Sample Name: 98354013
Lab Code: K9805755-014
Test Notes:

Prep Method: EPA 3550A
Analysis Method: 8270C
Units mg/Kg (ppm)
Basis Dry

| CAS Number | TIC | Retention Time (minutes) | Estimated Concentration | Result Notes |
|------------|---------|--------------------------|-------------------------|--------------|
| - | Unknown | 7.71 | 0.3 | X |

X

See case narrative

mg/12/98

Approved By R. Weigel Date 10/21/98 00122

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:
Project:
Sample Matrix:

Roy F Weston, Inc
Duwamish River/4000-027-001-2019-38
Sediment

Service Request: K9805755
Date Collected: 8/24/98
Date Received: 8/25/98

Base Neutral/Acid Semivolatile Organic Compounds

| Sample Name | 98354014 | Units | mg/Kg (ppm) | | | | | |
|---------------------------------|--------------|-----------------|-------------|-----------------|----------------|---------------|--------|--------------|
| Lab Code | K9805755-015 | Basis | Dry | | | | | |
| Analyte | Prep Method | Analysis Method | MRL | Dilution Factor | Date Extracted | Date Analyzed | Result | Result Notes |
| Bis(2-chloroethyl) Ether | EPA 3550A | 8270C | 0.04 | 1 | 8/28/98 | 10/2/98 | ND | |
| Phenol | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/2/98 | 0.03 | |
| 2-Chlorophenol | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/2/98 | ND | |
| 1,3-Dichlorobenzene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/2/98 | ND | |
| 1,2-Dichlorobenzene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/2/98 | ND | |
| 1,4-Dichlorobenzene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/2/98 | ND | |
| Benzyl Alcohol | EPA 3550A | 8270C | 0.05 | 1 | 8/28/98 | 10/2/98 | ND | |
| Bis(2-chloroisopropyl) Ether | EPA 3550A | 8270C | 0.04 | 1 | 8/28/98 | 10/2/98 | ND | |
| 2-Methylphenol | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/2/98 | ND | |
| Hexachloroethane | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/2/98 | ND | |
| N-Nitrosodi-n-propylamine | EPA 3550A | 8270C | 0.04 | 1 | 8/28/98 | 10/2/98 | ND | |
| 3- and 4-Methylphenol Coelution | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/2/98 | ND | |
| Nitrobenzene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/2/98 | ND | |
| Isophorone | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/2/98 | ND | |
| 2-Nitrophenol | EPA 3550A | 8270C | 0.1 | 1 | 8/28/98 | 10/2/98 | ND | |
| 2,4-Dimethylphenol | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/2/98 | ND | |
| Bis(2-chloroethoxy)methane | EPA 3550A | 8270C | 0.04 | 1 | 8/28/98 | 10/2/98 | ND | |
| 2,4-Dichlorophenol | EPA 3550A | 8270C | 0.06 | 1 | 8/28/98 | 10/2/98 | ND | |
| Benzoic Acid | EPA 3550A | 8270C | 0.2 | 1 | 8/28/98 | 10/2/98 | ND | |
| 1,2,4-Trichlorobenzene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/2/98 | ND | |
| Naphthalene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/2/98 | ND | |
| 4-Chloroaniline | EPA 3550A | 8270C | 0.06 | 1 | 8/28/98 | 10/2/98 | ND | |
| Hexachlorobutadiene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/2/98 | ND | |
| 4-Chloro-3-methylphenol | EPA 3550A | 8270C | 0.04 | 1 | 8/28/98 | 10/2/98 | ND | |
| 2-Methylnaphthalene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/2/98 | ND | |
| Hexachlorocyclopentadiene | EPA 3550A | 8270C | 0.1 | 1 | 8/28/98 | 10/2/98 | ND | WJ |
| 2,4,6-Trichlorophenol | EPA 3550A | 8270C | 0.2 | 1 | 8/28/98 | 10/2/98 | ND | |
| 2,4,5-Trichlorophenol | EPA 3550A | 8270C | 0.2 | 1 | 8/28/98 | 10/2/98 | ND | |
| 2-Chloronaphthalene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/2/98 | ND | |
| 2-Nitroaniline | EPA 3550A | 8270C | 0.1 | 1 | 8/28/98 | 10/2/98 | ND | |
| Acenaphthylene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/2/98 | ND | |
| Dimethyl Phthalate | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/2/98 | ND | |
| 2,6-Dinitrotoluene | EPA 3550A | 8270C | 0.2 | 1 | 8/28/98 | 10/2/98 | ND | |
| Acenaphthene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/2/98 | ND | |
| 3-Nitroaniline | EPA 3550A | 8270C | 0.2 | 1 | 8/28/98 | 10/2/98 | ND | |
| 2,4-Dinitrophenol | EPA 3550A | 8270C | 0.2 | 1 | 8/28/98 | 10/2/98 | ND | |
| Dibenzofuran | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/2/98 | ND | |
| 4-Nitrophenol | EPA 3550A | 8270C | 0.1 | 1 | 8/28/98 | 10/2/98 | ND | |
| 2,4-Dinitrotoluene | EPA 3550A | 8270C | 0.2 | 1 | 8/28/98 | 10/2/98 | ND | |
| Fluorene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/2/98 | 0.02 | |
| 4-Chlorophenyl Phenyl Ether | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/2/98 | ND | |
| Diethyl Phthalate | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/2/98 | ND | |

Approved By
03755SVM.AY3 15-10-13-98

C. H. Heines

Date 10/14/98

00123

WJ
10/14/98

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Roy F Weston, Inc
Project: Duwamish River/4000-027-001-2019-38
Sample Matrix: Sediment

Service Request: K9805755
Date Collected: 8/24/98
Date Received: 8/25/98

Base Neutral/Acid Semivolatile Organic Compounds

| Sample Name | 98354014 | Units | mg/Kg (ppm) |
|-------------|--------------|-------|-------------|
| Lab Code | K9805755-015 | Basis | Dry |
| Test Notes | | | |

| Analyte | Prep Method | Analysis Method | MRL | Dilution Factor | Date Extracted | Date Analyzed | Result | Result Notes |
|-----------------------------|-------------|-----------------|------|-----------------|----------------|---------------|--------|--------------|
| 4-Nitroaniline | EPA 3550A | 8270C | 0 1 | 1 | 8/28/98 | 10/2/98 | ND | |
| 2-Methyl-4,6-dinitrophenol | EPA 3550A | 8270C | 0 2 | 1 | 8/28/98 | 10/2/98 | ND | |
| N-Nitrosodiphenylamine | EPA 3550A | 8270C | 0 04 | 1 | 8/28/98 | 10/2/98 | ND | |
| 4-Bromophenyl Phenyl Ether | EPA 3550A | 8270C | 0 04 | 1 | 8/28/98 | 10/2/98 | ND | |
| Hexachlorobenzene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | ND | |
| Pentachlorophenol (PCP) | EPA 3550A | 8270C | 0 1 | 1 | 8/28/98 | 10/2/98 | ND | |
| Phenanthrene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | 0 18 | |
| Anthracene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | 0 06 | |
| Di-n-butyl Phthalate | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | ND | |
| Fluoranthene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | 0 60 | |
| Pyrene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | 0 51 | |
| Butyl Benzyl Phthalate | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | 0 04 | |
| 3,3'-Dichlorobenzidine | EPA 3550A | 8270C | 0 2 | 1 | 8/28/98 | 10/2/98 | ND | |
| Benz(a)anthracene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | 0 21 | |
| Chrysene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | 0 33 | |
| Bis(2-ethylhexyl) Phthalate | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | 0 40 | |
| Di-n-octyl Phthalate | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | ND | |
| Benzo(b)fluoranthene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | 0 29 | |
| Benzo(k)fluoranthene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | 0 24 | |
| Benzo(a)pyrene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | 0 22 | |
| Indeno(1,2,3-cd)pyrene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | 0 12 | |
| Dibenz(a,h)anthracene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | 0 02 | |
| Benzo(g,h,i)perylene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | 0 10 | |
| Carbazole | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | 0 02 | |

WAT/12/99

Approved By _____
 IS2p/082985VM.AY3 15 10/13/98

C. Neines

Date 10/14/98

0.0124

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Roy F. Weston, Inc
Project: Duwamish River/4000-027-001-2019-38
Sample Matrix: Sediment

Service Request: K9805755
Date Collected: 8/24/98
Date Received: 8/25/98
Date Extracted: 8/28/98
Date Analyzed: 10/2/98

Tentatively Identified Compounds (TIC)
Base Neutral/Acid Semivolatile Organic Compounds

Sample Name 98354014
Lab Code K9805755-015
Test Notes

Prep Method EPA 3550A
Analysis Method 8270C
Units. mg/Kg (ppm)
Basis Dry

| CAS Number | TIC | Retention Time (minutes) | Estimated Concentration | Result Notes |
|-------------------|----------------------|---------------------------------|--------------------------------|---------------------|
| - | Unknown | 7.73 | 0.2 | X |
| 544-63-8 | Tetradecanoic acid | 18.81 | 0.2 | |
| - | Unknown organic acid | 19.57 | 0.2 | |
| - | Unknown organic acid | 20.60 | 0.5 | |
| 57-10-3 | Hexadecanoic acid | 20.75 | 0.4 | |
| - | Unknown PAH | 22.79 | 0.2 | |
| - | Unknown PAH | 23.91 | 0.2 | |
| - | Unknown aldehyde | 27.07 | 1.3 | |
| - | Unknown | 28.76 | 0.2 | |
| - | Unknown aldehyde | 29.46 | 1.0 | |
| - | Unknown | 29.95 | 0.8 | |
| 57-88-5 | Cholesterol | 30.44 | 0.5 | |
| - | Unknown | 30.68 | 0.9 | |
| - | Unknown | 31.19 | 0.3 | |
| - | Unknown | 32.56 | 0.5 | |
| - | Unknown | 32.63 | 0.6 | |
| - | Unknown | 32.72 | 0.6 | |
| - | Unknown | 33.19 | 1.2 | |

X

See case narrative

WGT/12/99

Approved By D. Weigel

Date 10/21/98

00125

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Roy F Weston, Inc
 Project: Duwamish River/4000-027-001-2019-38
 Sample Matrix: Sediment

Service Request: K9805755
 Date Collected: 8/24/98
 Date Received: 8/25/98

Base Neutral/Acid Semivolatile Organic Compounds

| | | | |
|-------------|--------------|-------|-------------|
| Sample Name | 98354015 | Units | mg/Kg (ppm) |
| Lab Code. | K9805755-016 | Basis | Dry |
| Test Notes | | | |

| Analyte | Prep Method | Analysis Method | MRL | Dilution Factor | Date Extracted | Date Analyzed | Result | Result Notes |
|---------------------------------|-------------|-----------------|------|-----------------|----------------|---------------|--------|--------------|
| Bis(2-chloroethyl) Ether | EPA 3550A | 8270C | 0.04 | 1 | 8/28/98 | 10/3/98 | ND | |
| Phenol | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2-Chlorophenol | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| 1,3-Dichlorobenzene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| 1,2-Dichlorobenzene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| 1,4-Dichlorobenzene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Benzyl Alcohol | EPA 3550A | 8270C | 0.05 | 1 | 8/28/98 | 10/3/98 | ND | |
| Bis(2-chloroisopropyl) Ether | EPA 3550A | 8270C | 0.04 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2-Methylphenol | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Hexachloroethane | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| N-Nitrosodi-n-propylamine | EPA 3550A | 8270C | 0.04 | 1 | 8/28/98 | 10/3/98 | ND | |
| 3- and 4-Methylphenol Coelution | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Nitrobenzene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Isophorone | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2-Nitrophenol | EPA 3550A | 8270C | 0.1 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2,4-Dimethylphenol | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Bis(2-chloroethoxy)methane | EPA 3550A | 8270C | 0.04 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2,4-Dichlorophenol | EPA 3550A | 8270C | 0.06 | 1 | 8/28/98 | 10/3/98 | ND | |
| Benzoic Acid | EPA 3550A | 8270C | 0.2 | 1 | 8/28/98 | 10/3/98 | ND | |
| 1,2,4-Trichlorobenzene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Naphthalene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| 4-Chloroaniline | EPA 3550A | 8270C | 0.06 | 1 | 8/28/98 | 10/3/98 | ND | |
| Hexachlorobutadiene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| 4-Chloro-3-methylphenol | EPA 3550A | 8270C | 0.04 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2-Methylnaphthalene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Hexachlorocyclopentadiene | EPA 3550A | 8270C | 0.1 | 1 | 8/28/98 | 10/3/98 | ND | WCJ |
| 2,4,6-Trichlorophenol | EPA 3550A | 8270C | 0.2 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2,4,5-Trichlorophenol | EPA 3550A | 8270C | 0.2 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2-Chloronaphthalene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2-Nitroaniline | EPA 3550A | 8270C | 0.1 | 1 | 8/28/98 | 10/3/98 | ND | |
| Acenaphthylene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Dimethyl Phthalate | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2,6-Dinitrotoluene | EPA 3550A | 8270C | 0.2 | 1 | 8/28/98 | 10/3/98 | ND | |
| Acenaphthene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| 3-Nitroaniline | EPA 3550A | 8270C | 0.2 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2,4-Dinitrophenol | EPA 3550A | 8270C | 0.2 | 1 | 8/28/98 | 10/3/98 | ND | |
| Dibenzofuran | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| 4-Nitrophenol | EPA 3550A | 8270C | 0.1 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2,4-Dinitrotoluene | EPA 3550A | 8270C | 0.2 | 1 | 8/28/98 | 10/3/98 | ND | |
| Fluorene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | 0.02 | |
| 4-Chlorophenyl Phenyl Ether | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Diethyl Phthalate | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |

WAT 1/2/99

Approved By
05755SVMAY4 - 10-10-13-98

C. L. Davies

Date 10/14/98

00126
Page No

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:
Project:
Sample Matrix:

Roy F. Weston, Inc
Duwamish River/4000-027-001-2019-38
Sediment

Service Request: K9805755
Date Collected: 8/24/98
Date Received: 8/25/98

Base Neutral/Acid Semivolatile Organic Compounds

| | | | |
|--------------|--------------|-------|-------------|
| Sample Name: | 98354015 | Units | mg/Kg (ppm) |
| Lab Code | K9805755-016 | Basis | Dry |
| Test Notes | | | |

| Analyte | Prep Method | Analysis Method | MRL | Dilution Factor | Date Extracted | Date Analyzed | Result | Result Notes |
|-----------------------------|-------------|-----------------|------|-----------------|----------------|---------------|--------|--------------|
| 4-Nitroaniline | EPA 3550A | 8270C | 0 1 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2-Methyl-4,6-dinitrophenol | EPA 3550A | 8270C | 0 2 | 1 | 8/28/98 | 10/3/98 | ND | |
| N-Nitrosodiphenylamine | EPA 3550A | 8270C | 0 04 | 1 | 8/28/98 | 10/3/98 | ND | |
| 4-Bromophenyl Phenyl Ether | EPA 3550A | 8270C | 0 04 | 1 | 8/28/98 | 10/3/98 | ND | |
| Hexachlorobenzene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Pentachlorophenol (PCP) | EPA 3550A | 8270C | 0 1 | 1 | 8/28/98 | 10/3/98 | ND | |
| Phenanthrene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 20 | |
| Anthracene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 09 | |
| Di-n-butyl Phthalate | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Fluoranthene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 63 | |
| Pyrene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 67 | |
| Butyl Benzyl Phthalate | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 06 | |
| 3,3'-Dichlorobenzidine | EPA 3550A | 8270C | 0 2 | 1 | 8/28/98 | 10/3/98 | ND | |
| Benz(a)anthracene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 34 | |
| Chrysene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 48 | |
| Bis(2-ethylhexyl) Phthalate | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 1 1 | |
| Di-n-octyl Phthalate | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Benzo(b)fluoranthene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 42 | |
| Benzo(k)fluoranthene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 36 | |
| Benzo(a)pyrene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 31 | |
| Indeno(1,2,3-cd)pyrene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 16 | |
| Di(benz(a,h)anthracene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 04 | |
| Benzo(g,h,i)perylene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 15 | |
| Carbazole | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 02 | |

Approved By _____
1S2pV632988VM.AY4 - 16 10/13/98

CC Weines

Date 10/14/98

00137

MGT.12/99

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Roy F Weston, Inc
Project: Duwamish River/4000-027-001-2019-38
Sample Matrix: Sediment

Service Request: K9805755
Date Collected: 8/24/98
Date Received: 8/25/98
Date Extracted: 8/28/98
Date Analyzed: 10/3/98

Tentatively Identified Compounds (TIC)
Base Neutral/Acid Semivolatile Organic Compounds

| Sample Name | 98354015 | Prep Method | EPA 3550A |
|-------------|----------------------|--------------------------|-------------------------|
| Lab Code | K9805755-016 | Analysis Method | 8270C |
| Test Notes | | Units | mg/Kg (ppm) |
| CAS Number | TIC | Retention Time (minutes) | Estimated Concentration |
| | | | Basis |
| 544-63-8 | Tetradecanoic acid | 18 82 | 0 2 |
| - | Unknown organic acid | 19 58 | 0 2 |
| - | Unknown | 20 62 | 0 7 |
| - | Unknown | 21 19 | 0 2 |
| 641-85-0 | Allopregnane | 22 79 | 0 2 |
| - | Unknown PAH | 23 92 | 0 2 |
| - | Unknown aldehyde | 27 08 | 1 5 |
| - | Unknown | 27 84 | 0 4 |
| 192-97-2 | Benzo(e)pyrene | 28 07 | 0 6 |
| - | Unknown | 29 48 | 1 7 |
| - | Unknown | 29 97 | 0 6 |
| 57-88-5 | Cholesterol | 30 45 | 0 8 |
| - | Unknown | 30 70 | 1 2 |
| - | Unknown | 32 58 | 0 8 |
| - | Unknown | 32 64 | 1 0 |
| - | Unknown | 32 73 | 0 9 |
| - | Unknown | 33 20 | 1 8 |
| - | Unknown | 33 53 | 0 3 |
| - | Unknown | 33 62 | 0 5 |

Approved By _____

C. Haines

TIC/052695 SVM AY4 - 16T 10/13/98

Date 10/14/98

00128
Page No

MGT/12/98

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Roy F Weston, Inc
 Project: Duwamish River/4000-027-001-2019-38
 Sample Matrix: Sediment

Service Request: K9805755
 Date Collected: 8/24/98
 Date Received: 8/25/98

Base Neutral/Acid Semivolatile Organic Compounds

| Sample Name | 98354016 | Units | mg/Kg (ppm) | | | | | |
|---------------------------------|--------------|-----------------|-------------|-----------------|----------------|---------------|--------|--------------|
| Lab Code | K9805755-017 | Basis | Dry | | | | | |
| Test Notes | | | | | | | | |
| Analyte | Prep Method | Analysis Method | MRL | Dilution Factor | Date Extracted | Date Analyzed | Result | Result Notes |
| Bis(2-chloroethyl) Ether | EPA 3550A | 8270C | 0.04 | 1 | 8/28/98 | 10/3/98 | ND | |
| Phenol | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2-Chlorophenol | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| 1,3-Dichlorobenzene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| 1,2-Dichlorobenzene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| 1,4-Dichlorobenzene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Benzyl Alcohol | EPA 3550A | 8270C | 0.05 | 1 | 8/28/98 | 10/3/98 | ND | |
| Bis(2-chloroisopropyl) Ether | EPA 3550A | 8270C | 0.04 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2-Methylphenol | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Hexachloroethane | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| N-Nitrosodi-n-propylamine | EPA 3550A | 8270C | 0.04 | 1 | 8/28/98 | 10/3/98 | ND | |
| 3- and 4-Methylphenol Coelution | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Nitrobenzene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Isophorone | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2-Nitrophenol | EPA 3550A | 8270C | 0.1 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2,4-Dimethylphenol | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Bis(2-chloroethoxy)methane | EPA 3550A | 8270C | 0.04 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2,4-Dichlorophenol | EPA 3550A | 8270C | 0.06 | 1 | 8/28/98 | 10/3/98 | ND | |
| Benzoic Acid | EPA 3550A | 8270C | 0.2 | 1 | 8/28/98 | 10/3/98 | ND | |
| 1,2,4-Trichlorobenzene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Naphthalene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| 4-Chloroaniline | EPA 3550A | 8270C | 0.06 | 1 | 8/28/98 | 10/3/98 | ND | |
| Hexachlorobutadiene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| 4-Chloro-3-methylphenol | EPA 3550A | 8270C | 0.04 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2-Methylnaphthalene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Hexachlorocyclopentadiene | EPA 3550A | 8270C | 0.1 | 1 | 8/28/98 | 10/3/98 | ND | WT |
| 2,4,6-Trichlorophenol | EPA 3550A | 8270C | 0.2 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2,4,5-Trichlorophenol | EPA 3550A | 8270C | 0.2 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2-Chloronaphthalene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2-Nitroaniline | EPA 3550A | 8270C | 0.1 | 1 | 8/28/98 | 10/3/98 | ND | |
| Acenaphthylene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Dimethyl Phthalate | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | 0.03 | |
| 2,6-Dinitrotoluene | EPA 3550A | 8270C | 0.2 | 1 | 8/28/98 | 10/3/98 | ND | |
| Acenaphthene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| 3-Nitroaniline | EPA 3550A | 8270C | 0.2 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2,4-Dinitrophenol | EPA 3550A | 8270C | 0.2 | 1 | 8/28/98 | 10/3/98 | ND | |
| Dibenzofuran | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| 4-Nitrophenol | EPA 3550A | 8270C | 0.1 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2,4-Dinitrotoluene | EPA 3550A | 8270C | 0.2 | 1 | 8/28/98 | 10/3/98 | ND | |
| Fluorene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | 0.03 | |
| 4-Chlorophenyl Phenyl Ether | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Diethyl Phthalate | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |

WT 1/269

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Roy F Weston, Inc
 Project: Duwanish River/4000-027-001-2019-38
 Sample Matrix: Sediment

Service Request: K9805755
 Date Collected: 8/24/98
 Date Received: 8/25/98

Base Neutral/Acid Semivolatile Organic Compounds

| | | | |
|-------------|--------------|-------|-------------|
| Sample Name | 98354016 | Units | mg/Kg (ppm) |
| Lab Code | K9805755-017 | Basis | Dry |
| Test Notes | | | |

| Analyte | Prep Method | Analysis Method | MRL | Dilution Factor | Date Extracted | Date Analyzed | Result | Result Notes |
|-----------------------------|-------------|-----------------|------|-----------------|----------------|---------------|--------|--------------|
| 4-Nitroaniline | EPA 3550A | 8270C | 0 1 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2-Methyl-4,6-dinitrophenol | EPA 3550A | 8270C | 0 2 | 1 | 8/28/98 | 10/3/98 | ND | |
| N-Nitrosodiphenylamine | EPA 3550A | 8270C | 0 04 | 1 | 8/28/98 | 10/3/98 | ND | |
| 4-Bromophenyl Phenyl Ether | EPA 3550A | 8270C | 0.04 | 1 | 8/28/98 | 10/3/98 | ND | |
| Hexachlorobenzene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Pentachlorophenol (PCP) | EPA 3550A | 8270C | 0 1 | 1 | 8/28/98 | 10/3/98 | ND | |
| Phenanthrene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 17 | |
| Anthracene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 09 | |
| Di-n-butyl Phthalate | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Fluoranthene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 55 | |
| Pyrene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 61 | |
| Butyl Benzyl Phthalate | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 04 | |
| 3,3'-Dichlorobenzidine | EPA 3550A | 8270C | 0 2 | 1 | 8/28/98 | 10/3/98 | ND | |
| Benz(a)anthracene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 28 | |
| Chrysene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 46 | |
| Bis(2-ethylhexyl) Phthalate | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 48 | |
| Di-n-octyl Phthalate | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Benzo(b)fluoranthene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 40 | |
| Benzo(k)fluoranthene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 35 | |
| Benzo(a)pyrene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 30 | |
| Indeno(1,2,3-cd)pyrene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 15 | |
| Dibenz(a,h)anthracene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 04 | |
| Benzo(g,h,i)perylene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 13 | |
| Carbazole | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 02 | |

WGT 1/2/97

Approved By _____
 1S2p/BS299SVM AY4 - 17 10/13/98

C. Hanes

Date 10/14/98

00130

Page No

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Roy F Weston, Inc
Project: Duwamish River/4000-027-001-2019-38
Sample Matrix: Sediment

Service Request: K9805755
Date Collected: 8/24/98
Date Received: 8/25/98
Date Extracted: 8/28/98
Date Analyzed: 10/3/98

Tentatively Identified Compounds (TIC)
Base Neutral/Acid Semivolatile Organic Compounds

Sample Name 98354016
Lab Code K9805755-017
Test Notes.

Prep Method EPA 3550A
Analysis Method 8270C
Units mg/Kg (ppm)
Basis Dry

| CAS Number | TIC | Retention Time (minutes) | Estimated Concentration | Result Notes |
|------------|-------------------|--------------------------|-------------------------|--------------|
| - | Unknown | 20 61 | 0 5 | |
| 57-10-3 | Hexadecanoic acid | 20 75 | 0 4 | |
| - | Unknown PAH | 22 79 | 0 2 | |
| - | Unknown PAH | 23 91 | 0 2 | |
| - | Unknown aldehyde | 27 08 | 1 0 | |
| - | Unknown | 27 83 | 0 4 | |
| 192-97-2 | Benzo(e)pyrene | 28 07 | 0 5 | |
| 198-55-0 | Perylene | 28 59 | 0 2 | |
| - | Unknown aldehyde | 29 48 | 1 0 | |
| - | Unknown | 29 96 | 0 9 | |
| 57-88-5 | Cholesterol | 30 45 | 0 8 | |
| - | Unknown | 30 70 | 0 9 | |
| - | Unknown | 30 84 | 0 3 | |
| - | Unknown | 32 58 | 0 5 | |
| - | Unknown PAH | 32 64 | 0 7 | |
| - | Unknown | 32 73 | 0 7 | |
| - | Unknown | 33 20 | 1 3 | |
| - | Unknown | 34 13 | 0 2 | |

Approved By _____

C. Culver

TIC/0528955SVM AY4 - 17T 10/13/98

Date 10/14/98

00131

WGT 10/26/98

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:
Project:
Sample Matrix:

Roy F Weston, Inc
Duwamish River/4000-027-001-2019-38
Sediment

Service Request: K9805755
Date Collected: 8/24/98
Date Received: 8/25/98

Base Neutral/Acid Semivolatile Organic Compounds

| Sample Name | 98354017 | Units | mg/Kg (ppm) | | | | | |
|---------------------------------|--------------|-----------------|-------------|-----------------|----------------|---------------|--------|-------|
| Lab Code | K9805755-018 | Basis | Dry | | | | | |
| Analyte | Prep Method | Analysis Method | MRL | Dilution Factor | Date Extracted | Date Analyzed | Result | Notes |
| Bis(2-chloroethyl) Ether | EPA 3550A | 8270C | 0.04 | 1 | 8/28/98 | 10/3/98 | ND | |
| Phenol | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | 0.07 | |
| 2-Chlorophenol | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| 1,3-Dichlorobenzene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| 1,2-Dichlorobenzene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| 1,4-Dichlorobenzene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Benzyl Alcohol | EPA 3550A | 8270C | 0.05 | 1 | 8/28/98 | 10/3/98 | ND | |
| Bis(2-chloroisopropyl) Ether | EPA 3550A | 8270C | 0.04 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2-Methylphenol | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Hexachloroethane | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| N-Nitrosodi-n-propylamine | EPA 3550A | 8270C | 0.04 | 1 | 8/28/98 | 10/3/98 | ND | |
| 3- and 4-Methylphenol Coelution | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Nitrobenzene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Isophorone | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2-Nitrophenol | EPA 3550A | 8270C | 0.1 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2,4-Dimethylphenol | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Bis(2-chloroethoxy)methane | EPA 3550A | 8270C | 0.04 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2,4-Dichlorophenol | EPA 3550A | 8270C | 0.06 | 1 | 8/28/98 | 10/3/98 | ND | |
| Benzoic Acid | EPA 3550A | 8270C | 0.2 | 1 | 8/28/98 | 10/3/98 | ND | |
| 1,2,4-Trichlorobenzene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Naphthalene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| 4-Chloroaniline | EPA 3550A | 8270C | 0.06 | 1 | 8/28/98 | 10/3/98 | ND | |
| Hexachlorobutadiene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| 4-Chloro-3-methylphenol | EPA 3550A | 8270C | 0.04 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2-Methylnaphthalene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Hexachlorocyclopentadiene | EPA 3550A | 8270C | 0.1 | 1 | 8/28/98 | 10/3/98 | ND | WT |
| 2,4,6-Trichlorophenol | EPA 3550A | 8270C | 0.2 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2,4,5-Trichlorophenol | EPA 3550A | 8270C | 0.2 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2-Chloronaphthalene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2-Nitroaniline | EPA 3550A | 8270C | 0.1 | 1 | 8/28/98 | 10/3/98 | ND | |
| Acenaphthylene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Dimethyl Phthalate | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2,6-Dinitrotoluene | EPA 3550A | 8270C | 0.2 | 1 | 8/28/98 | 10/3/98 | ND | |
| Acenaphthene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | 0.02 | |
| 3-Nitroaniline | EPA 3550A | 8270C | 0.2 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2,4-Dinitrophenol | EPA 3550A | 8270C | 0.2 | 1 | 8/28/98 | 10/3/98 | ND | |
| Dibenzofuran | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | 0.02 | |
| 4-Nitrophenol | EPA 3550A | 8270C | 0.1 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2,4-Dinitrotoluene | EPA 3550A | 8270C | 0.2 | 1 | 8/28/98 | 10/3/98 | ND | |
| Fluorene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | 0.03 | |
| 4-Chlorophenyl Phenyl Ether | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Diethyl Phthalate | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/3/98 | ND | |

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MGT 1/2/99

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Roy F Weston, Inc
 Project: Duwamish River/4000-027-001-2019-38
 Sample Matrix: Sediment

Service Request: K9805755
 Date Collected: 8/24/98
 Date Received: 8/25/98

Base Neutral/Acid Semivolatile Organic Compounds

| Sample Name | 98354017 | Units | mg/Kg (ppm) | | | | | |
|-----------------------------|--------------|-----------------|-------------|-----------------|----------------|---------------|--------|--------------|
| Lab Code | K9805755-018 | Basis | Dry | | | | | |
| Analyte | Prep Method | Analysis Method | MRL | Dilution Factor | Date Extracted | Date Analyzed | Result | Result Notes |
| 4-Nitroaniline | EPA 3550A | 8270C | 0 1 | 1 | 8/28/98 | 10/3/98 | ND | |
| 2-Methyl-4,6-dinitrophenol | EPA 3550A | 8270C | 0 2 | 1 | 8/28/98 | 10/3/98 | ND | |
| N-Nitrosodiphenylamine | EPA 3550A | 8270C | 0 04 | 1 | 8/28/98 | 10/3/98 | ND | |
| 4-Bromophenyl Phenyl Ether | EPA 3550A | 8270C | 0 04 | 1 | 8/28/98 | 10/3/98 | ND | |
| Hexachlorobenzene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Pentachlorophenol (PCP) | EPA 3550A | 8270C | 0 1 | 1 | 8/28/98 | 10/3/98 | ND | |
| Phenanthrene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 23 | |
| Anthracene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 10 | |
| Di-n-butyl Phthalate | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Fluoranthene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 62 | |
| Pyrene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 92 | |
| Butyl Benzyl Phthalate | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 05 | |
| 3,3'-Dichlorobenzidine | EPA 3550A | 8270C | 0 2 | 1 | 8/28/98 | 10/3/98 | ND | |
| Benz(a)anthracene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 39 | |
| Chrysene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 57 | |
| Bis(2-ethylhexyl) Phthalate | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 52 | |
| Di-n-octyl Phthalate | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | ND | |
| Benzo(b)fluoranthene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 58 | |
| Benzo(k)fluoranthene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 49 | |
| Benzo(a)pyrene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 41 | |
| Indeno(1,2,3-cd)pyrene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 20 | |
| Dibenz(a,h)anthracene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 05 | |
| Benzo(g,h,i)perylene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 17 | |
| Carbazole | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/3/98 | 0 02 | |

WGT.12/99

Approved By _____
IS2p/05298SVM.AY4 - 18 10/13/98

C. Holmes

Date 10/14/98

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Roy F Weston, Inc
Project: Duwamish River/4000-027-001-2019-38
Sample Matrix: Sediment

Service Request: K9805755
Date Collected: 8/24/98
Date Received: 8/25/98
Date Extracted: 8/28/98
Date Analyzed: 10/3/98

Tentatively Identified Compounds (TIC)
Base Neutral/Acid Semivolatile Organic Compounds

| Sample Name | 98354017 | Prep Method | EPA 3550A | |
|-------------|--------------------|--------------------------|-------------------------|--------------|
| Lab Code | K9805755-018 | Analysis Method | 8270C | |
| Test Notes | | Units | mg/Kg (ppm) | |
| CAS Number | TIC | Retention Time (minutes) | Estimated Concentration | Result Notes |
| 544-63-8 | Tetradecanoic acid | 18 82 | 0 2 | |
| - | Unknown | 20 61 | 0 5 | |
| - | Unknown alkene | 22 08 | 0 2 | |
| - | Unknown | 22 79 | 0 3 | |
| - | Unknown aldehyde | 25 17 | 0 2 | |
| - | Unknown aldehyde | 27 09 | 1 0 | |
| 192-97-2 | Benzo(e)pyrene | 28 09 | 0 5 | |
| - | Unknown | 29 48 | 1 0 | |
| - | Unknown | 29 97 | 0 6 | |
| 57-88-5 | Cholesterol | 30 45 | 1 1 | |
| - | Unknown | 30 70 | 1 2 | |
| - | Unknown | 32 59 | 0 4 | |
| - | Unknown PAH | 32 65 | 0 7 | |
| - | Unknown | 32 74 | 0 7 | |
| - | Unknown | 33 21 | 1 3 | |

Approved By _____

CC Weenes

Date

10/14/98

TIC/052595SVM AY4 - 18T 10/13/98

00134

WAT 10/2/98

Page No.

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Roy F Weston, Inc
 Project: Duwamish River/4000-027-001-2019-38
 Sample Matrix: Sediment

Service Request: K9805755
 Date Collected: 8/25/98
 Date Received: 8/26/98

Base Neutral/Acid Semivolatile Organic Compounds

| Sample Name | 98354018 | Units | mg/Kg (ppm) | | | | | |
|---------------------------------|--------------|-----------------|-------------|-----------------|----------------|---------------|--------|--------------|
| Lab Code | K9805755-019 | Basis | Dry | | | | | |
| Test Notes | | | | | | | | |
| Analyte | Prep Method | Analysis Method | MRL | Dilution Factor | Date Extracted | Date Analyzed | Result | Result Notes |
| Bis(2-chloroethyl) Ether | EPA 3550A | 8270C | 0.04 | 1 | 8/28/98 | 10/2/98 | ND | |
| Phenol | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/2/98 | ND | |
| 2-Chlorophenol | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/2/98 | ND | |
| 1,3-Dichlorobenzene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/2/98 | ND | |
| 1,2-Dichlorobenzene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/2/98 | ND | |
| 1,4-Dichlorobenzene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/2/98 | ND | |
| Benzyl Alcohol | EPA 3550A | 8270C | 0.05 | 1 | 8/28/98 | 10/2/98 | ND | |
| Bis(2-chloroisopropyl) Ether | EPA 3550A | 8270C | 0.04 | 1 | 8/28/98 | 10/2/98 | ND | |
| 2-Methylphenol | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/2/98 | ND | |
| Hexachloroethane | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/2/98 | ND | |
| N-Nitrosodi-n-propylamine | EPA 3550A | 8270C | 0.04 | 1 | 8/28/98 | 10/2/98 | ND | |
| 3- and 4-Methylphenol Coelution | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/2/98 | ND | |
| Nitrobenzene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/2/98 | ND | |
| Isophorone | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/2/98 | ND | |
| 2-Nitrophenol | EPA 3550A | 8270C | 0.1 | 1 | 8/28/98 | 10/2/98 | ND | |
| 2,4-Dimethylphenol | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/2/98 | ND | |
| Bis(2-chloroethoxy)methane | EPA 3550A | 8270C | 0.04 | 1 | 8/28/98 | 10/2/98 | ND | |
| 2,4-Dichlorophenol | EPA 3550A | 8270C | 0.06 | 1 | 8/28/98 | 10/2/98 | ND | |
| Benzoic Acid | EPA 3550A | 8270C | 0.2 | 1 | 8/28/98 | 10/2/98 | ND | |
| 1,2,4-Trichlorobenzene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/2/98 | ND | |
| Naphthalene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/2/98 | ND | |
| 4-Chloroaniline | EPA 3550A | 8270C | 0.06 | 1 | 8/28/98 | 10/2/98 | ND | |
| Hexachlorobutadiene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/2/98 | ND | |
| 4-Chloro-3-methylphenol | EPA 3550A | 8270C | 0.04 | 1 | 8/28/98 | 10/2/98 | ND | |
| 2-Methylnaphthalene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/2/98 | ND | |
| Hexachlorocyclopentadiene | EPA 3550A | 8270C | 0.1 | 1 | 8/28/98 | 10/2/98 | ND | WT |
| 2,4,6-Trichlorophenol | EPA 3550A | 8270C | 0.2 | 1 | 8/28/98 | 10/2/98 | ND | |
| 2,4,5-Trichlorophenol | EPA 3550A | 8270C | 0.2 | 1 | 8/28/98 | 10/2/98 | ND | |
| 2-Chloronaphthalene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/2/98 | ND | |
| 2-Nitroaniline | EPA 3550A | 8270C | 0.1 | 1 | 8/28/98 | 10/2/98 | ND | |
| Acenaphthylene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/2/98 | ND | |
| Dimethyl Phthalate | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/2/98 | ND | |
| 2,6-Dinitrotoluene | EPA 3550A | 8270C | 0.2 | 1 | 8/28/98 | 10/2/98 | ND | |
| Acenaphthene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/2/98 | ND | |
| 3-Nitroaniline | EPA 3550A | 8270C | 0.2 | 1 | 8/28/98 | 10/2/98 | ND | |
| 2,4-Dinitrophenol | EPA 3550A | 8270C | 0.2 | 1 | 8/28/98 | 10/2/98 | ND | |
| Dibenzofuran | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/2/98 | ND | |
| 4-Nitrophenol | EPA 3550A | 8270C | 0.1 | 1 | 8/28/98 | 10/2/98 | ND | |
| 2,4-Dinitrotoluene | EPA 3550A | 8270C | 0.2 | 1 | 8/28/98 | 10/2/98 | ND | |
| Fluorene | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/2/98 | ND | |
| 4-Chlorophenyl Phenyl Ether | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/2/98 | ND | |
| Diethyl Phthalate | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/2/98 | ND | |

WT 1/2/99

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:
Project:
Sample Matrix:

Roy F Weston, Inc
Duwamish River/4000-027-001-2019-38
Sediment

Service Request: K9805755
Date Collected: 8/25/98
Date Received: 8/26/98

Base Neutral/Acid Semivolatile Organic Compounds

| Sample Name | 98354018 | Units | mg/Kg (ppm) |
|-------------|--------------|-------|-------------|
| Lab Code | K9805755-019 | Basis | Dry |

| Analyte | Prep Method | Analysis Method | MRL | Dilution Factor | Date Extracted | Date Analyzed | Result | Result Notes |
|-----------------------------|-------------|-----------------|------|-----------------|----------------|---------------|--------|--------------|
| 4-Nitroaniline | EPA 3550A | 8270C | 0 1 | 1 | 8/28/98 | 10/2/98 | ND | |
| 2-Methyl-4,6-dinitrophenol | EPA 3550A | 8270C | 0 2 | 1 | 8/28/98 | 10/2/98 | ND | |
| N-Nitrosodiphenylamine | EPA 3550A | 8270C | 0 04 | 1 | 8/28/98 | 10/2/98 | ND | |
| 4-Bromophenyl Phenyl Ether | EPA 3550A | 8270C | 0 04 | 1 | 8/28/98 | 10/2/98 | ND | |
| Hexachlorobenzene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | ND | |
| Pentachlorophenol (PCP) | EPA 3550A | 8270C | 0 1 | 1 | 8/28/98 | 10/2/98 | ND | |
| Phenanthrene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | 0 16 | |
| Anthracene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | ND | |
| Di-n-butyl Phthalate | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | ND | |
| Fluoranthene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | 0 39 | |
| Pyrene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | 0 30 | |
| Butyl Benzyl Phthalate | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | 0 03 | |
| 3,3'-Dichlorobenzidine | EPA 3550A | 8270C | 0 2 | 1 | 8/28/98 | 10/2/98 | ND | |
| Benz(a)anthracene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | 0 08 | |
| Chrysene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | 0 16 | |
| Bis(2-ethylhexyl) Phthalate | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | 0 28 | |
| Di-n-octyl Phthalate | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | ND | |
| Benzo(b)fluoranthene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | 0 13 | |
| Benzo(k)fluoranthene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | 0 12 | |
| Benzo(a)pyrene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | 0 09 | |
| Indeno(1,2,3-cd)pyrene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | 0 08 | |
| Dibenz(a,h)anthracene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | ND | |
| Benzo(g,h,i)perylene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | 0 08 | |
| Carbazole | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | ND | |

Approved By _____
IS2p/BS2938 SVM.AY4 - 19 10/13/98

C. Haens

Date

10/14/98

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Page No

W.H. Haens

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Roy F Weston, Inc
Project: Duwamish River/4000-027-001-2019-38
Sample Matrix: Sediment

Service Request: K9805755
Date Collected: 8/25/98
Date Received: 8/26/98
Date Extracted: 8/28/98
Date Analyzed: 10/2/98

Tentatively Identified Compounds (TIC)
Base Neutral/Acid Semivolatile Organic Compounds

Sample Name: 98354018
Lab Code K9805755-019
Test Notes:

Prep Method: EPA 3550A
Analysis Method: 8270C
Units: mg/Kg (ppm)
Basis: Dry

| CAS Number | TIC | Retention | Estimated Concentration | Result Notes |
|------------|------------------|----------------|-------------------------|--------------|
| | | Time (minutes) | | |
| - | Unknown | 7.73 | 0.7 | X |
| 150-86-7 | Phytol | 21.86 | 0.9 | |
| - | Unknown | 23.95 | 0.3 | |
| - | Unknown | 24.23 | 0.6 | |
| - | Unknown aldehyde | 25.14 | 0.3 | |
| - | Unknown | 26.71 | 0.4 | |
| - | Unknown | 27.81 | 0.9 | |
| - | Unknown | 29.18 | 0.5 | |
| - | Unknown aldehyde | 29.45 | 1.6 | |
| - | Unknown alcohol | 29.97 | 0.7 | |
| 57-88-5 | Cholesterol | 30.42 | 0.8 | |
| - | Unknown | 32.41 | 1.7 | |
| - | Unknown | 32.55 | 1.5 | |
| - | Unknown PAH | 32.62 | 1.5 | |
| - | Unknown | 32.71 | 1.2 | |
| - | Unknown | 33.18 | 2.6 | |
| - | Unknown | 33.49 | 0.6 | |
| - | Unknown | 33.85 | 0.5 | |
| - | Unknown | 34.10 | 0.7 | |
| - | Unknown | 35.42 | 0.4 | |

X

See case narrative

10/12/98

Approved By S. Wiegert

Date 10/21/98

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Roy F Weston, Inc
 Project: Duwamish River/4000-027-001-2019-38
 Sample Matrix: Sediment

Service Request: K9805755
 Date Collected: 8/25/98
 Date Received: 8/26/98

Base Neutral/Acid Semivolatile Organic Compounds

| | | | |
|-------------|--------------|-------|-------------|
| Sample Name | 98354019 | Units | mg/Kg (ppm) |
| Lab Code | K9805755-020 | Basis | Dry |
| Test Notes | | | |

| Analyte | Prep Method | Analysis Method | MRL | Dilution Factor | Date Extracted | Date Analyzed | Result | Result Notes |
|---------------------------------|-------------|-----------------|------|-----------------|----------------|---------------|--------|--------------|
| Bis(2-chloroethyl) Ether | EPA 3550A | 8270C | 0 04 | 1 | 8/28/98 | 10/2/98 | ND | |
| Phenol | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | ND | |
| 2-Chlorophenol | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | ND | |
| 1,3-Dichlorobenzene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | ND | |
| 1,2-Dichlorobenzene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | ND | |
| 1,4-Dichlorobenzene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | ND | |
| Benzyl Alcohol | EPA 3550A | 8270C | 0 05 | 1 | 8/28/98 | 10/2/98 | ND | |
| Bis(2-chloroisopropyl) Ether | EPA 3550A | 8270C | 0 04 | 1 | 8/28/98 | 10/2/98 | ND | |
| 2-Methylphenol | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | ND | |
| Hexachloroethane | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | ND | |
| N-Nitrosodi-n-propylamine | EPA 3550A | 8270C | 0 04 | 1 | 8/28/98 | 10/2/98 | ND | |
| 3- and 4-Methylphenol Coelution | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | ND | |
| Nitrobenzene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | ND | |
| Isophorone | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | ND | |
| 2-Nitrophenol | EPA 3550A | 8270C | 0 1 | 1 | 8/28/98 | 10/2/98 | ND | |
| 2,4-Dimethylphenol | EPA 3550A | 8270C | 0.02 | 1 | 8/28/98 | 10/2/98 | ND | |
| Bis(2-chloroethoxy)methane | EPA 3550A | 8270C | 0 04 | 1 | 8/28/98 | 10/2/98 | ND | |
| 2,4-Dichlorophenol | EPA 3550A | 8270C | 0 06 | 1 | 8/28/98 | 10/2/98 | ND | |
| Benzoic Acid | EPA 3550A | 8270C | 0 2 | 1 | 8/28/98 | 10/2/98 | ND | |
| 1,2,4-Trichlorobenzene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | ND | |
| Naphthalene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | ND | |
| 4-Chloroaniline | EPA 3550A | 8270C | 0 06 | 1 | 8/28/98 | 10/2/98 | ND | |
| Hexachlorobutadiene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | ND | |
| 4-Chloro-3-methylphenol | EPA 3550A | 8270C | 0 04 | 1 | 8/28/98 | 10/2/98 | ND | |
| 2-Methylnaphthalene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | ND | |
| Hexachlorocyclopentadiene | EPA 3550A | 8270C | 0 1 | 1 | 8/28/98 | 10/2/98 | ND | |
| 2,4,6-Trichlorophenol | EPA 3550A | 8270C | 0 2 | 1 | 8/28/98 | 10/2/98 | ND | |
| 2,4,5-Trichlorophenol | EPA 3550A | 8270C | 0 2 | 1 | 8/28/98 | 10/2/98 | ND | |
| 2-Chloronaphthalene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | ND | |
| 2-Nitroaniline | EPA 3550A | 8270C | 0 1 | 1 | 8/28/98 | 10/2/98 | ND | |
| Acenaphthylene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | ND | |
| Dimethyl Phthalate | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | 0 08 | |
| 2,6-Dinitrotoluene | EPA 3550A | 8270C | 0 2 | 1 | 8/28/98 | 10/2/98 | ND | |
| Acenaphthene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | ND | |
| 3-Nitroaniline | EPA 3550A | 8270C | 0 2 | 1 | 8/28/98 | 10/2/98 | ND | |
| 2,4-Dinitrophenol | EPA 3550A | 8270C | 0 2 | 1 | 8/28/98 | 10/2/98 | ND | |
| Dibenzofuran | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | ND | |
| 4-Nitrophenol | EPA 3550A | 8270C | 0 1 | 1 | 8/28/98 | 10/2/98 | ND | |
| 2,4-Dinitrotoluene | EPA 3550A | 8270C | 0 2 | 1 | 8/28/98 | 10/2/98 | ND | |
| Fluorene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | 0 02 | |
| 4-Chlorophenyl Phenyl Ether | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | ND | |
| Diethyl Phthalate | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | ND | |

Approved By
 US7358V.M.AY4 - 2010/13/98

C. Deines

Date 10/14/98

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Roy F Weston, Inc
 Project: Duwamish River/4000-027-001-2019-38
 Sample Matrix: Sediment

Service Request: K9805755
 Date Collected: 8/25/98
 Date Received: 8/26/98

Base Neutral/Acid Semivolatile Organic Compounds

| | | | |
|-------------|--------------|-------|-------------|
| Sample Name | 98354019 | Units | mg/Kg (ppm) |
| Lab Code: | K9805755-020 | Basis | Dry |
| Test Notes | | | |

| Analyte | Prep Method | Analysis Method | MRL | Dilution Factor | Date Extracted | Date Analyzed | Result | Result Notes |
|-----------------------------|-------------|-----------------|------|-----------------|----------------|---------------|--------|--------------|
| 4-Nitroaniline | EPA 3550A | 8270C | 0 1 | 1 | 8/28/98 | 10/2/98 | ND | |
| 2-Methyl-4,6-dinitrophenol | EPA 3550A | 8270C | 0 2 | 1 | 8/28/98 | 10/2/98 | ND | |
| N-Nitrosodiphenylamine | EPA 3550A | 8270C | 0 04 | 1 | 8/28/98 | 10/2/98 | ND | |
| 4-Bromophenyl Phenyl Ether | EPA 3550A | 8270C | 0 04 | 1 | 8/28/98 | 10/2/98 | ND | |
| Hexachlorobenzene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | ND | |
| Pentachlorophenol (PCP) | EPA 3550A | 8270C | 0 1 | 1 | 8/28/98 | 10/2/98 | ND | |
| Phenanthrene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | 0 15 | |
| Anthracene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | 0 02 | |
| Di-n-butyl Phthalate | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | 0 02 | |
| Fluoranthene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | 0 41 | |
| Pyrene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | 0 33 | |
| Butyl Benzyl Phthalate | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | 0 03 | |
| 3,3'-Dichlorobenzidine | EPA 3550A | 8270C | 0 2 | 1 | 8/28/98 | 10/2/98 | ND | |
| Benz(a)anthracene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | 0 13 | |
| Chrysene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | 0 19 | |
| Bis(2-ethylhexyl) Phthalate | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | 0 45 | |
| Di-n-octyl Phthalate | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | ND | |
| Benzo(b)fluoranthene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | 0 16 | |
| Benzo(k)fluoranthene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | 0 16 | |
| Benzo(a)pyrene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | 0 12 | |
| Indeno(1,2,3-cd)pyrene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | 0 09 | |
| Dibenz(a,h)anthracene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | ND | |
| Benzo(g,h,i)perylene | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | 0 08 | |
| Carbazole | EPA 3550A | 8270C | 0 02 | 1 | 8/28/98 | 10/2/98 | ND | |

Aug 12/98

Approved By _____
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Ch. Barnes

Date 10/14/98

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Roy F Weston, Inc
Project: Duwamish River/4000-027-001-2019-38
Sample Matrix: Sediment

Service Request: K9805755
Date Collected: 8/25/98
Date Received: 8/26/98
Date Extracted: 8/28/98
Date Analyzed: 10/2/98

Tentatively Identified Compounds (TIC)
Base Neutral/Acid Semivolatile Organic Compounds

| Sample Name | 98354019 | Prep Method | EPA 3550A | |
|-------------|------------------------------|--------------------------|-------------------------|--------------|
| Lab Code | K9805755-020 | Analysis Method | 8270C | |
| Test Notes | | Units | mg/Kg (ppm) | |
| CAS Number | TIC | Retention Time (minutes) | Estimated Concentration | Result Notes |
| 150-86-7 | Phytol | 21 86 | 0 7 | |
| - | Unknown | 23 90 | 1 1 | |
| - | Unknown | 23 96 | 1 1 | |
| - | Unknown | 24 24 | 1 4 | |
| - | Unknown aldehyde | 25 15 | 0 9 | |
| 822-23-1 | Acetic acid, octadecyl ester | 26 73 | 0 7 | |
| - | Unknown | 27 83 | 1 8 | |
| - | Unknown | 29 19 | 1 0 | |
| - | Unknown aldehyde | 29 46 | 3 1 | |
| - | Unknown | 29 98 | 1 6 | |
| 57-88-5 | Cholesterol | 30 43 | 0 9 | |
| - | Unknown | 30 67 | 0 7 | |
| 83-47-6 | gamma-Sitosterol | 32 43 | 3 2 | |
| - | Unknown | 32 57 | 2 5 | |
| - | Unknown | 32 64 | 2 4 | |
| - | Unknown PAH | 32 73 | 1 9 | |
| - | Unknown | 33 20 | 4 4 | |
| - | Unknown | 33 86 | 0 9 | |
| - | Unknown | 34 12 | 1 2 | |
| - | Unknown | 35 43 | 0 7 | |

Approved By _____

C. Heines

Date

10/14/98

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